THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION
Colleges of Agricultural and Environmental Sciences & Family and Consumer Sciences

2012 PEANUT PRODUCTION UPDATE

Learning for Life

2012 PEANUT UPDATE

Table of Contents

INTRODUCTION

The members of the University of Georgia Extension Peanut Team are pleased to present the *2012 Peanut Production Update*. The purpose of this publication is to provide peanut producers with new and timely information that can be used to make cost-effective management decisions in the upcoming growing season. Contact your local county extension agent for additional information, publications, or field problem assistance.

John P. Beasley, Jr., Editor

The University of Georgia Extension Peanut Team

David Adams – Entomology
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Mark Boudreau – Biological and Agricultural Engineering
Bill Branch – Peanut Breeder
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*Printing of the *2012 Peanut Update* was made possible through the generosity and a grant provided by the **Georgia Peanut Commission**

Non-Irrigated Peanut
4-Row Combine, 6-Row Equipment
South Georgia, 2012

Estimated Costs and Returns

Expected Yield: **1.45** ton Yield Your Farm: _____

Variable Costs	Unit	Amount	$/Unit	Cost/Acre	$/ton	Your Farm
Seed	pounds	130	$ 1.40	$ 182.00	$ 125.52	
Inoculant	pounds	5	$ 1.45	$ 7.25	$ 5.00	
Lime/Gypsum *	ton	0.5	$ 101.00	$ 50.50	$ 34.83	
Fertilizer						
Boron	pounds	0.5	$ 5.25	$ 2.63	$ 1.81	
Phosphate	pounds	0	$ 0.50	$ -	$ -	
Potash	pounds	0	$ 0.58	$ -	$ -	
Weed Control	acre	1	$ 55.55	$ 55.55	$ 38.31	
Insect Control	acre	1	$ 45.40	$ 45.40	$ 31.31	
Disease Control **	acre	1	$ 39.58	$ 39.58	$ 27.30	
Preharvest Machinery						
Fuel	gallon	9.2	$ 3.55	$ 32.78	$ 22.60	
Repairs and Maintenance	acre	1	$ 17.06	$ 17.06	$ 11.77	
Harvest Machinery						
Fuel	gallon	10.3	$ 3.55	$ 36.54	$ 25.20	
Repairs and Maintenance	acre	1	$ 29.06	$ 29.06	$ 20.04	
Labor	hours	2.8	$ 11.25	$ 31.74	$ 21.89	
Crop Insurance	acre	1	$ 51.00	$ 51.00	$ 35.17	
Land Rent	acre	1	$ -	$ -	$ -	
Interest on Operating Capital	percent	$ 290.54	6.5%	$ 18.89	$ 13.02	
Cleaning	ton	0.5	$ 12.00	$ 5.74	$ 3.96	
Drying	ton	1.0	$ 30.00	$ 29.15	$ 20.10	
Marketing	ton	1.5	$ 3.00	$ 4.35	$ 3.00	
NPB Checkoff	dollars	$ 0.01	515	$ 5.15	$ 3.55	
Total Variable Costs:				**$ 644.35**	**$ 444.38**	

Fixed Costs						
Machinery Depreciation, Taxes, Insurance and Housing						
Preharvest Machinery	acre	1	$ 49.04	$ 49.04	$ 33.82	
Harvest Machinery	acre	1	$ 90.44	$ 90.44	$ 62.37	
General Overhead	% of VC	$ 644.35	5%	$ 32.22	$ 22.22	
Management	% of VC	$ 644.35	5%	$ 32.22	$ 22.22	
Owned Land Cost, Taxes, Cash Payment, etc.	acre	1	$ -	$ -	$ -	
Other _____	acre	1	$ -	$ -	$ -	
Total Fixed Costs				**$ 203.92**	**$ 140.63**	

Total Costs Excluding Land		**$ 848.27**	**$ 585.01**
Your Profit Goal	**$** _____	**/ton**	
Price Needed for Profit	**$**	**/ton**	

* Lime/gypsum application is prorated at 0.5 ton to equal 1.5 ton application every 3 years.

** If soilborne disease threatens to be severe, additional application of soilborne fungicide may be recommended, add $15-20/spray. If leafspot threatens to be severe, additional application of chlorothalonil may be recommended at 3/4 pint ($3-5/ac). A nematicide (where needed) = $50-75/ac.

Budget developed by Nathan Smith and Amanda Smith. The authors would like to acknowledge contributions by John Beasley, Eric Prostko, David Adams, Glen Harris, Bob Kemerait and the Georgia County Extension Agents.

Sensitivity Analysis of 4-Row Combine, 6-Row Equipment

Net Returns Above Variable Costs Per Acre

Varying Prices and Yields (ton)

	-25%	-10%	Expected	+10%	+25%
Price \ ton/Acre	1.09	1.31	1.45	1.60	1.81
$400	**-$209.35**	**-$122.35**	**-$64.35**	**-$6.35**	**$80.65**
$500	**-$100.60**	**$8.15**	**$80.65**	**$153.15**	**$261.90**
$600	**$8.15**	**$138.65**	**$225.65**	**$312.65**	**$443.15**
$700	**$116.90**	**$269.15**	**$370.65**	**$472.15**	**$624.40**
$800	**$225.65**	**$399.65**	**$515.65**	**$631.65**	**$805.65**

Estimated Labor and Machinery Costs per Acre

Preharvest Operations

Operation	Acres/Hour	Number of Times Over	Labor Use*** (hrs/ac)	Fuel Use (gal/ac)	Repairs ($/ac)	Fixed Costs ($/ac)
Heavy Disk 27' with Tractor (180-199 hp) MFWD 190	13.2	2	0.19	1.48	$ 3.19	$ 9.27
Plow 4 Bottom Switch with Tractor (180-199 hp) MFWD 190	2.3	1	0.54	4.20	$ 6.25	$ 18.87
Disk & Incorporate 32' with Tractor (180-199 hp) MFWD 190	15.3	1	0.08	0.64	$ 1.67	$ 4.36
Field Cultivate Fld 32' with Tractor (180-199 hp) MFWD 190	21.4	1	0.06	0.46	$ 0.86	$ 3.59
Plant & Pre-Rigid 6R-36 with Tractor (120-139 hp) 2WD 130	8.9	1	0.14	0.75	$ 2.01	$ 5.59
Spray (Broadcast) 60' with Tractor (120-139 hp) 2WD 130	35.5	9	0.32	1.70	$ 3.09	$ 7.36
Total Preharvest Values			1.32	9.23	$ 17.06	$ 49.04

Harvest Operations

Operation	Acres/Hour	Number of Times Over	Labor Use*** (hrs/ac)	Fuel Use (gal/ac)	Repairs ($/ac)	Fixed Costs ($/ac)
Peanut Dig/Inverter 4R-36 with Tractor (180-199 hp) MFWD 190	3.6	1	0.35	2.74	$ 6.83	$ 16.27
Pull-type Peanut Combine 4R-36 with Tractor (180-199 hp) MFWD 190	2.2	1	0.57	4.48	$ 17.76	$ 62.23
Peanut Wagon 21' with Tractor (120-139 hp) 2WD 130	2.2	1	0.57	3.07	$ 4.47	$ 11.93
Total Harvest Values			1.50	10.29	$ 29.06	$ 90.44

*** Includes unallocated labor factor of 0.25. Unallocated labor factor is percentage allowance for additional labor required to move equipment and hook/unhook implements, etc.

Budget developed by Nathan Smith and Amanda Smith. The authors would like to acknowledge contributions by John Beasley, Eric Prostko, David Adams, Glen Harris, Bob Kemerait and the Georgia County Extension Agents.

Irrigated Peanut
4-Row Combine, 6-Row Equipment
South Georgia, 2012

Estimated Costs and Returns

Expected Yield: **2.1** ton Yield Your Farm: _____

Variable Costs	Unit	Amount	$/Unit	Cost/Acre	$/ton	Your Farm
Seed	pounds	130	$ 1.40	$ 182.00	$ 86.67	
Inoculant	pounds	5	$ 1.45	$ 7.25	$ 3.45	
Lime/Gypsum *	ton	0.5	$ 101.00	$ 50.50	$ 24.05	
Fertilizer						
Boron	pounds	0.5	$ 5.25	$ 2.63	$ 1.25	
Phosphate	pounds	0	$ 0.50	$ -	$ -	
Potash	pounds	0	$ 0.58	$ -	$ -	
Weed Control	acre	1	$ 46.21	$ 46.21	$ 22.00	
Insect Control	acre	1	$ 45.40	$ 45.40	$ 21.62	
Disease Control **	acre	1	$ 75.91	$ 75.91	$ 36.15	
Preharvest Machinery						
Fuel	gallon	9.2	$ 3.55	$ 32.78	$ 15.61	
Repairs and Maintenance	acre	1	$ 17.06	$ 17.06	$ 8.13	
Harvest Machinery						
Fuel	gallon	10.3	$ 3.55	$ 36.54	$ 17.40	
Repairs and Maintenance	acre	1	$ 29.06	$ 29.06	$ 13.84	
Labor	hours	2.8	$ 11.25	$ 31.74	$ 15.11	
Irrigation***	applications	6	$ 11.60	$ 69.60	$ 33.14	
Crop Insurance	acre	1	$ 40.00	$ 40.00	$ 19.05	
Land Rent	acre	1	$ -	$ -	$ -	
Interest on Operating Capital	percent	$ 333.34	6.5%	$ 21.67	$ 10.32	
Cleaning	ton	0.7	$ 12.00	$ 8.32	$ 3.96	
Drying	ton	1.4	$ 30.00	$ 42.21	$ 20.10	
Marketing	ton	2.1	$ 3.00	$ 6.30	$ 3.00	
NPB Checkoff	dollars	$ 0.01	746	$ 7.46	$ 3.55	
Total Variable Costs:				**$ 752.62**	**$ 358.39**	

Fixed Costs						
Machinery Depreciation, Taxes, Insurance and Housing						
Preharvest Machinery	acre	1	$ 49.04	$ 49.04	$ 23.35	
Harvest Machinery	acre	1	$ 90.44	$ 90.44	$ 43.07	
Irrigation	acre	1	$ 110.00	$ 110.00	$ 52.38	
General Overhead	% of VC	$ 752.62	5%	$ 37.63	$ 17.92	
Management	% of VC	$ 752.62	5%	$ 37.63	$ 17.92	
Owned Land Cost, Taxes, Cash Payment, etc.	acre	1	$ -	$ -	$ -	
Other _____	acre	1	$ -	$ -	$ -	
Total Fixed Costs				**$ 324.74**	**$ 154.64**	

Total Costs Excluding Land	**$ 1,077.37**	**$ 513.03**
Your Profit Goal	**$** _____	**/ton**
Price Needed for Profit	**$**	**/ton**

* Lime/gypsum application is prorated at 0.5 ton to equal 1.5 ton application every 3 years.

** If soilborne disease threatens to be severe, additional application of soilborne fungicide may be recommended, add $15-20/spray. If leafspot threatens to be severe, additional application of chlorothalonil may be recommended at 3/4 pint ($3-5/ac). A nematicide (where needed) = $50-75/ac.

*** Average of diesel and electric irrigation application costs. Electric is estimated at $7/appl and diesel is estimated at $16.20/appl when diesel costs $3.55/gal.

Budget developed by Nathan Smith and Amanda Smith. The authors would like to acknowledge contributions by John Beasley, Eric Prostko, David Adams, Glen Harris, Bob Kemerait and the Georgia County Extension Agents.

Sensitivity Analysis of 4-Row Combine, 6-Row Equipment

Net Returns Above Variable Costs Per Acre

Varying Prices and Yields (ton)

Price \ ton/Acre	-25% 1.58	-10% 1.89	Expected 2.10	+10% 2.31	+25% 2.63
$400	**-$122.62**	**$3.38**	**$87.38**	**$171.38**	**$297.38**
$500	**$34.88**	**$192.38**	**$297.38**	**$402.38**	**$559.88**
$600	**$192.38**	**$381.38**	**$507.38**	**$633.38**	**$822.38**
$700	**$349.88**	**$570.38**	**$717.38**	**$864.38**	**$1,084.88**
$800	**$507.38**	**$759.38**	**$927.38**	**$1,095.38**	**$1,347.38**

Estimated Labor and Machinery Costs per Acre

Preharvest Operations

Operation	Acres/Hour	Number of Times Over	Labor Use**** (hrs/ac)	Fuel Use (gal/ac)	Repairs ($/ac)	Fixed Costs ($/ac)
Heavy Disk 27' with Tractor (180-199 hp) MFWD 190	13.2	2	0.19	1.48	$ 3.19	$ 9.27
Plow 4 Bottom Switch with Tractor (180-199 hp) MFWD 190	2.3	1	0.54	4.20	$ 6.25	$ 18.87
Disk & Incorporate 32' with Tractor (180-199 hp) MFWD 190	15.3	1	0.08	0.64	$ 1.67	$ 4.36
Field Cultivate Fld 32' with Tractor (180-199 hp) MFWD 190	21.4	1	0.06	0.46	$ 0.86	$ 3.59
Plant & Pre-Rigid 6R-36 with Tractor (120-139 hp) 2WD 130	8.9	1	0.14	0.75	$ 2.01	$ 5.59
Spray (Broadcast) 60' with Tractor (120-139 hp) 2WD 130	35.5	9	0.32	1.70	$ 3.09	$ 7.36
Total Preharvest Values			1.32	9.23	$ 17.06	$ 49.04

Harvest Operations

Operation	Acres/Hour	Number of Times Over	Labor Use**** (hrs/ac)	Fuel Use (gal/ac)	Repairs ($/ac)	Fixed Costs ($/ac)
Peanut Dig/Inverter 4R-36 with Tractor (180-199 hp) MFWD 190	3.6	1	0.35	2.74	$ 6.83	$ 16.27
Pull-type Peanut Combine 4R-36 with Tractor (180-199 hp) MFWD 190	2.2	1	0.57	4.48	$ 17.76	$ 62.23
Peanut Wagon 21' with Tractor (120-139 hp) 2WD 130	2.2	1	0.57	3.07	$ 4.47	$ 11.93
Total Harvest Values			1.50	10.29	$ 29.06	$ 90.44

**** Includes unallocated labor factor of 0.25. Unallocated labor factor is percentage allowance for additional labor required to move equipment and hook/unhook implements, etc.

Budget developed by Nathan Smith and Amanda Smith. The authors would like to acknowledge contributions by John Beasley, Eric Prostko, David Adams, Glen Harris, Bob Kemerait and the Georgia County Extension Agents.

Non-Irrigated Peanut, Strip Tillage
4-Row Combine, 6-Row Equipment
South Georgia, 2012

Estimated Costs and Returns

Expected Yield: **1.45** ton Yield Your Farm: _____

Variable Costs	Unit	Amount	$/Unit	Cost/Acre	$/ton	Your Farm
Cover Crop Seed	bushel	1.5	$ 20.00	$ 30.00	$ 20.69	
Seed	pounds	130	$ 1.40	$ 182.00	$ 125.52	
Inoculant	pounds	5	$ 1.45	$ 7.25	$ 5.00	
Lime/Gypsum *	ton	0.5	$ 101.00	$ 50.50	$ 34.83	
Fertilizer						
Boron	pounds	0.5	$ 5.25	$ 2.63	$ 1.81	
Phosphate	pounds	0	$ 0.50	$ -	$ -	
Potash	pounds	0	$ 0.58	$ -	$ -	
Weed Control	acre	1	$ 68.95	$ 68.95	$ 47.55	
Insect Control	acre	1	$ 45.40	$ 45.40	$ 31.31	
Disease Control **	acre	1	$ 39.58	$ 39.58	$ 27.30	
Preharvest Machinery						
Fuel	gallon	5.2	$ 3.55	$ 18.49	$ 12.75	
Repairs and Maintenance	acre	1	$ 9.95	$ 9.95	$ 6.87	
Harvest Machinery						
Fuel	gallon	10.3	$ 3.55	$ 36.54	$ 25.20	
Repairs and Maintenance	acre	1	$ 29.06	$ 29.06	$ 20.04	
Labor	hours	2.3	$ 11.25	$ 26.39	$ 18.20	
Crop Insurance	acre	1	$ 51.00	$ 51.00	$ 35.17	
Land Rent	acre	1	$ -	$ -	$ -	
Interest on Operating Capital	percent	$ 283.87	6.5%	$ 18.45	$ 12.73	
Cleaning	ton	0.5	$ 12.00	$ 5.74	$ 3.96	
Drying	ton	1.0	$ 30.00	$ 29.15	$ 20.10	
Marketing	ton	1.5	$ 3.00	$ 4.35	$ 3.00	
NPB Checkoff	dollars	$ 0.01	515	$ 5.15	$ 3.55	
Total Variable Costs:				**$ 660.57**	**$ 455.57**	
Fixed Costs						
Machinery Depreciation, Taxes, Insurance and Housing						
Preharvest Machinery	acre	1	$ 26.73	$ 26.73	$ 18.43	
Harvest Machinery	acre	1	$ 90.44	$ 90.44	$ 62.37	
General Overhead	% of VC	$ 660.57	5%	$ 33.03	$ 22.78	
Management	% of VC	$ 660.57	5%	$ 33.03	$ 22.78	
Owned Land Cost, Taxes, Cash Payment, etc.	acre	1	$ -	$ -	$ -	
Other _____	acre	1	$ -	$ -	$ -	
Total Fixed Costs				**$ 183.22**	**$ 126.36**	
Total Costs Excluding Land				**$ 843.80**	**$ 581.93**	
Your Profit Goal				**$** _____	**/ton**	
Price Needed for Profit				**$**	**/ton**	

* Lime/gypsum application is prorated at 0.5 ton to equal 1.5 ton application every 3 years.

** If soilborne disease threatens to be severe, additional application of soilborne fungicide may be recommended, add $15-20/spray. If leafspot threatens to be severe, additional application of chlorothalonil may be recommended at 3/4 pint ($3-5/ac). A nematicide (where needed) = $50-75/ac.

Budget developed by Amanda Smith and Nathan Smith. The authors would like to acknowledge contributions by John Beasley, Eric Prostko, David Adams, Glen Harris, Bob Kemerait and the Georgia County Extension Agents.

Sensitivity Analysis of 4-Row Combine, 6-Row Equipment

Net Returns Above Variable Costs Per Acre

Varying Prices and Yields (ton)

	-25%	-10%	Expected	+10%	+25%
Price \ ton/Acre	1.09	1.31	1.45	1.60	1.81
$400	**-$225.57**	**-$138.57**	**-$80.57**	**-$22.57**	**$64.43**
$500	**-$116.82**	**-$8.07**	**$64.43**	**$136.93**	**$245.68**
$600	**-$8.07**	**$122.43**	**$209.43**	**$296.43**	**$426.93**
$700	**$100.68**	**$252.93**	**$354.43**	**$455.93**	**$608.18**
$800	**$209.43**	**$383.43**	**$499.43**	**$615.43**	**$789.43**

Estimated Labor and Machinery Costs per Acre

Preharvest Operations

Operation	Acres/Hour	Number of Times Over	Labor Use*** (hrs/ac)	Fuel Use (gal/ac)	Repairs ($/ac)	Fixed Costs ($/ac)
Grain Drill 15' with Tractor (120-139 hp) 2WD 130	8.0	1	0.16	0.84	$ 1.90	$ 5.33
Spray (Broadcast) 60' with Tractor (120-139 hp) 2WD 130	35.5	1	0.04	0.19	$ 0.34	$ 0.82
Subsoiler low-till 6 shank with Tractor (180-199 hp) MFWD 190	9.8	1	0.13	1.00	$ 1.56	$ 4.92
Plant & Pre-Rigid 6R-36 with Tractor (180-199 hp) MFWD 190	8.9	1	0.14	1.10	$ 2.38	$ 6.67
Spray (Broadcast) 60' with Tractor (120-139 hp) 2WD 130	35.5	11	0.39	2.08	$ 3.78	$ 8.99
Total Preharvest Values			0.85	5.21	$ 9.95	$ 26.73

Harvest Operations

Operation	Acres/Hour	Number of Times Over	Labor Use*** (hrs/ac)	Fuel Use (gal/ac)	Repairs ($/ac)	Fixed Costs ($/ac)
Peanut Dig/Inverter 4R-36 with Tractor (180-199 hp) MFWD 190	3.6	1	0.35	2.74	$ 6.83	$ 16.27
Pull-type Peanut Combine 4R-36 with Tractor (180-199 hp) MFWD 190	2.2	1	0.57	4.48	$ 17.76	$ 62.23
Peanut Wagon 21' with Tractor (120-139 hp) 2WD 130	2.2	1	0.57	3.07	$ 4.47	$ 11.93
Total Harvest Values			1.50	10.29	$ 29.06	$ 90.44

*** Includes unallocated labor factor of 0.25. Unallocated labor factor is percentage allowance for additional labor required to move equipment and hook/unhook implements, etc.

Budget developed by Amanda Smith and Nathan Smith. The authors would like to acknowledge contributions by John Beasley, Eric Prostko, David Adams, Glen Harris, Bob Kemerait and the Georgia County Extension Agents.

Irrigated Peanut, Strip Tillage
4-Row Combine, 6-Row Equipment
South Georgia, 2012

Estimated Costs and Returns

Expected Yield: **2.1** ton Yield Your Farm: _____

Variable Costs	Unit	Amount	$/Unit	Cost/Acre	$/ton	Your Farm
Cover Crop Seed	bushel	1.5	$ 20.00	$ 30.00	$ 14.29	
Seed	pounds	130	$ 1.40	$ 182.00	$ 86.67	
Inoculant	pounds	5	$ 1.45	$ 7.25	$ 3.45	
Lime/Gypsum *	ton	0.5	$ 101.00	$ 50.50	$ 24.05	
Fertilizer						
Boron	pounds	0.5	$ 5.25	$ 2.63	$ 1.25	
Phosphate	pounds	0	$ 0.50	$ -	$ -	
Potash	pounds	0	$ 0.58	$ -	$ -	
Weed Control	acre	1	$ 59.63	$ 59.63	$ 28.39	
Insect Control	acre	1	$ 45.40	$ 45.40	$ 21.62	
Disease Control **	acre	1	$ 75.91	$ 75.91	$ 36.15	
Preharvest Machinery						
Fuel	gallon	5.2	$ 3.55	$ 18.49	$ 8.80	
Repairs and Maintenance	acre	1	$ 9.95	$ 9.95	$ 4.74	
Harvest Machinery						
Fuel	gallon	10.3	$ 3.55	$ 36.54	$ 17.40	
Repairs and Maintenance	acre	1	$ 29.06	$ 29.06	$ 13.84	
Labor	hours	2.3	$ 11.25	$ 26.39	$ 12.57	
Irrigation****	applications	5	$ 11.60	$ 58.00	$ 27.62	
Crop Insurance	acre	1	$ 40.00	$ 40.00	$ 19.05	
Land Rent	acre	1	$ -	$ -	$ -	
Interest on Operating Capital	percent	$ 320.87	6.5%	$ 20.86	$ 9.93	
Cleaning	ton	0.7	$ 12.00	$ 8.32	$ 3.96	
Drying	ton	1.4	$ 30.00	$ 42.21	$ 20.10	
Marketing	ton	2.1	$ 3.00	$ 6.30	$ 3.00	
NPB Checkoff	dollars	$ 0.01	746	$ 7.46	$ 3.55	
Total Variable Costs:				**$ 756.88**	**$ 360.42**	

Fixed Costs						
Machinery Depreciation, Taxes, Insurance and Housing						
Preharvest Machinery	acre	1	$ 26.73	$ 26.73	$ 12.73	
Harvest Machinery	acre	1	$ 90.44	$ 90.44	$ 43.07	
Irrigation	acre	1	$ 110.00	$ 110.00	$ 52.38	
General Overhead	% of VC	$ 756.88	5%	$ 37.84	$ 18.02	
Management	% of VC	$ 756.88	5%	$ 37.84	$ 18.02	
Owned Land Cost, Taxes, Cash Payment, etc.	acre	1	$ -	$ -	$ -	
Other _____	acre	1	$ -	$ -	$ -	
Total Fixed Costs				**$ 302.86**	**$ 144.22**	

Total Costs Excluding Land	**$ 1,059.74**	**$ 504.64**
Your Profit Goal	**$** _____	**/ton**
Price Needed for Profit	**$**	**/ton**

* Lime/gypsum application is prorated at 0.5 ton to equal 1.5 ton application every 3 years.

** If soilborne disease threatens to be severe, additional application of soilborne fungicide may be recommended, add $15-20/spray. If leafspot threatens to be severe, additional application of chlorothalonil may be recommended at 3/4 pint ($3-5/ac). A nematicide (where needed) = $50-75/ac.

*** Average of diesel and electric irrigation application costs. Electric is estimated at $7/appl and diesel is estimated at $16.20/appl when diesel costs $3.55/gal.

Budget developed by Amanda Smith and Nathan Smith. The authors would like to acknowledge contributions by John Beasley, Eric Prostko, David Adams, Glen Harris, Bob Kemerait and the Georgia County Extension Agents.

Sensitivity Analysis of 4-Row Combine, 6-Row Equipment

Net Returns Above Variable Costs Per Acre

Varying Prices and Yields (ton)

Price \ ton/Acre	-25% 1.58	-10% 1.89	Expected 2.10	+10% 2.31	+25% 2.63
$400	**-$126.88**	**-$0.88**	**$83.12**	**$167.12**	**$293.12**
$500	**$30.62**	**$188.12**	**$293.12**	**$398.12**	**$555.62**
$600	**$188.12**	**$377.12**	**$503.12**	**$629.12**	**$818.12**
$700	**$345.62**	**$566.12**	**$713.12**	**$860.12**	**$1,080.62**
$800	**$503.12**	**$755.12**	**$923.12**	**$1,091.12**	**$1,343.12**

Estimated Labor and Machinery Costs per Acre

Preharvest Operations

Operation	Acres/Hour	Number of Times Over	Labor Use**** (hrs/ac)	Fuel Use (gal/ac)	Repairs ($/ac)	Fixed Costs ($/ac)
Grain Drill 15' with Tractor (120-139 hp) 2WD 130	8.0	1	0.16	0.84	$ 1.90	$ 5.33
Spray (Broadcast) 60' with Tractor (120-139 hp) 2WD 130	35.5	1	0.04	0.19	$ 0.34	$ 0.82
Subsoiler low-till 6 shank with Tractor (180-199 hp) MFWD 190	9.8	1	0.13	1.00	$ 1.56	$ 4.92
Plant & Pre-Rigid 6R-36 with Tractor (180-199 hp) MFWD 190	8.9	1	0.14	1.10	$ 2.38	$ 6.67
Spray (Broadcast) 60' with Tractor (120-139 hp) 2WD 130	35.5	11	0.39	2.08	$ 3.78	$ 8.99
Total Preharvest Values			0.85	5.21	$ 9.95	$ 26.73

Harvest Operations

Operation	Acres/Hour	Number of Times Over	Labor Use**** (hrs/ac)	Fuel Use (gal/ac)	Repairs ($/ac)	Fixed Costs ($/ac)
Peanut Dig/Inverter 4R-36 with Tractor (180-199 hp) MFWD 190	3.6	1	0.35	2.74	$ 6.83	$ 16.27
Pull-type Peanut Combine 4R-36 with Tractor (180-199 hp) MFWD 190	2.2	1	0.57	4.48	$ 17.76	$ 62.23
Peanut Wagon 21' with Tractor (120-139 hp) 2WD 130	2.2	1	0.57	3.07	$ 4.47	$ 11.93
Total Harvest Values			1.50	10.29	$ 29.06	$ 90.44

**** Includes unallocated labor factor of 0.25. Unallocated labor factor is percentage allowance for additional labor required to move equipment and hook/unhook implements, etc.

Budget developed by Amanda Smith and Nathan Smith. The authors would like to acknowledge contributions by John Beasley, Eric Prostko, David Adams, Glen Harris, Bob Kemerait and the Georgia County Extension Agents.

UNIVERSITY OF GEORGIA PEANUT BREEDING PROGRAM

Bill Branch

In the U.S., there are four market types of peanut: runner, virginia, spanish, and valencia. Historically, all four market types have been grown in the southeast. However, the runner-type has been predominately grown for the past several decades. More recently, spanish and virginia-types have also been grown occasionally under contracts, and valencia-types are grown on small but consistent acreage annually for the fresh market boiling trade. Within each of these four U.S. market types, there are several new and improved varieties that have been developed and released from the University of Georgia Peanut Breeding Program.

RUNNER-TYPE:

"GEORGIA-06G" is a high-yielding, TSWV-resistant, runner-type peanut variety that was released in 2006. It was developed at the University of Georgia, Coastal Plain Experiment Station in Tifton, GA. Georgia-06G has a high level of resistance to tomato spotted wilt virus (TSWV). In multilocation tests conducted in Georgia during the past several years, Georgia-06G was likewise found to be among the lowest in TSWV disease incidence and highest in yield, grade, and dollar value return per acre compared to all of the other runner-types. Georgia-06G is a large-seeded runner-type variety with growth habit and medium maturity similar to Georgia Green. It also has very good stability and a wide-range of adaptability.

"GEORGIA GREENER" is a high-yielding, TSWV-resistant, runner-type peanut variety that was released in 2006. It was developed at the University of Georgia, Coastal Plain Experiment Station in Tifton, GA. Georgia Greener has a high level of resistance to tomato spotted wilt virus (TSWV) and CBR resistance. In multilocation tests conducted in Georgia during the past several years, Georgia Greener was found to be among the lowest in TSWV disease incidence and highest in yield, grade, and dollar value return per acre compared to all of the other runner-types. Georgia Greener is more of a regular runner-type seed size variety with growth habit and medium maturity similar to Georgia Green. It also has very good stability and a wide-range of adaptability.

"GEORGIA-07W" is a high-yielding, TSWV-resistant, white mold-resistant, runner-type peanut variety that was released in 2007. It was developed at the University of Georgia, Coastal Plain Experiment Station in Tifton, GA. Georgia-07W has a high level of resistance to both diseases, tomato spotted wilt virus (TSWV) and white mold or stem rot. In multilocation tests conducted in Georgia during the past several years, Georgia-07W was found to be among the lowest in TSWV incidence and total disease incidence, highest in yield, grade, and dollar value return per acre. Georgia-07W is a large-seeded runner-type variety with a runner growth habit and medium maturity. It also has very good stability and a wide-range of adaptability.

"GEORGIA-09B" is a new high-yielding, high-oleic, TSWV-resistant, medium-seeded, runner-type peanut variety that was released in 2009. It was developed at the University of Georgia, Coastal Plain Experiment Station, Tifton, GA. Georgia-09B originated from the

first backcross made with **'Georgia Green'**, as the recurrent parent. During past years averaged over several multilocation tests in Georgia, Georgia-09B had significantly less TSWV disease incidence, higher yield and percent TSMK grade, larger seed size, and greater dollar value return per acre compared to Georgia Green. Georgia-09B has also showed significantly higher TSMK grade percentage than 'Florida-07'and higher dollar value than 'York', 'AT-3085RO', and 'McCloud', and was found to have a medium runner seed size as compared to the larger high-oleic, runner-type varieties, Florida-07, AT-3085RO, and McCloud. Georgia-09B combines the excellent roasted flavor of Georgia Green with the high-oleic trait for longer shelf-life and improved oil quality of peanut and peanut products.

"GEORGIA-10T" is a new high-yielding, TSWV-resistant, large-seeded, runner-type peanut variety that was released by the Georgia Agricultural Experiment Stations in 2010. It was developed at the University of Georgia, Coastal Plain Experiment Station, Tifton, GA. During three-years averaged over multilocation tests in Georgia, Georgia-10T had significantly less mid-season TSWV incidence and late-season total disease (TD) incidence, higher yield, grade, and dollar value return per acre compared to Georgia-01R. However, Georgia-10T is most similar to **Georgia-01R** in later maturity. During the past few years at multilocations in Georgia when planted early (mid-April) to increase TSWV disease pressure, Georgia-10T was again found to be among the lowest in TSWV incidence and TD incidence, highest in pod yield, highest in TSMK grade, and highest in dollar value return per acre compared to many other runner-type varieties, respectively. Georgia-10T should be an excellent variety for an earlier planting option in the southeast.

VIRGINIA-TYPE:

"GEORGIA-08V" is a high-yielding, high-oleic, TSWV-resistant, large-seeded, virginia-type peanut variety that was released by the Georgia Agricultural Experiment Station in 2008. It was developed at the University of Georgia, Coastal Plain Experiment Station, Tifton, GA. Georgia-08V has the high-oleic (O) and low linoleic (L) fatty acid ratio for improved oil quality. During the past several years averaged over multilocations tests in Georgia, Georgia-08V had significantly less TSWV disease incidence, higher yield and percent ELK, larger seed size, and greater dollar value return per acre compared to Gregory, Perry, and CHAMPS. Georgia-08V has also showed significantly higher yield, ELK percentage, and dollar value than **Georgia Hi-O/L**, and was also found to have the largest seed size of all of the virginia-type varieties tested, including **Georgia-05E**.

"GEORGIA-11J" is a new high-yielding, high-oleic, TSWV-resistant, large-podded and large-seeded, virginia-type peanut variety that was released by the Georgia Agricultural Experiment Stations in 2011. It was developed at the University of Georgia, Coastal Plain Experiment Station, Tifton, GA. Georgia-11J also has the high-oleic (O) and low-linoleic (L) fatty acid ratio for improved oil quality. Georgia-11J is similar to another high-oleic virginia-type cultivar 'Georgia-08V' in having low TSWV disease incidence, high pod yield, high total sound mature kernel (TSMK) grade percentage, and high dollar value return per acre. However, during several years averaged over multilocation tests in Georgia, Georgia-11J had significantly higher percent of jumbo pod size and higher percent of extra-large kernels (ELK) compared to the check cultivar 'Georgia-08V'. Georgia-11J was also shown to have a significantly greater seed weight than Georgia-08V which was previously found to have the largest seed size of several other virginia-type cultivars.

SPANISH-TYPE:

"GEORGIA-04S" is a high-oleic small-seeded peanut variety that was released in 2004 by the Georgia Agricultural Experiment Station. Georgia-04S is intended for the same confectionary or candy market as used by spanish-types. Similar to **Georgia Browne**, Georgia-04S would also be excellent for the roasted or peanut butter trade as well. It has pods and seed size similar to other spanish market type varieties. Georgia-04S has shown a significantly higher yield, TSMK grade, and dollar value per acre compared to all other leading spanish varieties during the past eleven-year (2000-2010) in Georgia. Georgia-04S also has significantly better TSWV-resistance than these other spanish varieties.

VALENCIA-TYPE:

"GEORGIA VALENCIA" is a valencia-type peanut variety that was released in 2000 by the Georgia Agricultural Experiment Stations. **"Georgia Red"** is a similar valencia-type variety that was jointly released by the Georgia Agricultural Experiment Stations and USDA-ARS in 1986. Both Georgia Valencia and Georgia Red are excellent choices for the fresh-market boiling trade in the Southeast because of their high yield performance, large fruit size, and compact bunch growth habit. In Georgia Peanut Variety Tests, the ten-year (2001-2010) average performance shows Georgia Valencia and Georgia Red to have higher yields, grades, and dollar values compared to Valencia McRan, New Mexico Valencia C, New Mexico Valencia A, H & W Val 101, and H & W Val 102. Both Georgia Valencia and Georgia Red also have better disease tolerance with similar maturity as these other valencia varieties.

Multiple years and multiple locations are recommended for variety comparisons. The following tables present such combined variety test results in Georgia across years and locations for each of the four U.S. market types.

Table 1. THREE-YEAR AVERAGE DOLLAR VALUE RETURN PER ACRE OF RUNNER-TYPE PEANUT VARIETIES ACROSS MULTILOCATIONS IN GEORGIA, 2009-11.

Runner	Gross Dollar Values ($/a)			3-Yr
Variety	2009	2010	2011	Mean
Georgia-06G	808	754	906	823
Georgia-07W	836	730	896	821
Georgia-10T	831	731	823	795
Georgia Greener	761	714	875	783
*Georgia-09B	781	726	819	775
*Florida-07	791	695	824	770
Tifguard	715	673	789	726
*Georgia-02C	781	643	751	725
Georgia Green	649	654	757	687
*FloRun™ '107'	-	660	827	-

* High-Oleic Varieties

Table 2. TWO-YEAR AVERAGE YIELD (LB/A) OF 10 RUNNER-TYPE PEANUT VARIETIES UNDER IRRIGATION AND NONIRRIGATION AT MULTILOCATIONS IN GEORGIA, 2010-11.

Runner	Tifton		Plains		Midville	
Variety	Irrig.	Nonirrig	Irrig.	Nonirrig	Irrig.	Nonirrig†
Georgia-06G	5546	4253	5400	2206	6408	4667
Georgia-07W	5115	4474	4815	2092	6663	4498
Georgia-10T	5308	4390	4102	1643	6423	3528
Georgia Greener	5258	4140	4876	1967	6317	4555
Georgia-09B	5161	3603	4880	2052	6570	5273
Florida-07	5461	4472	4690	2030	6372	4520
Tifguard	4899	4098	4460	1720	5998	4079
Georgia-02C	4522	3840	4887	1852	5102	4210
Georgia Green	4802	3438	4654	1745	5479	4594
*FloRun™ '107'	5292	3866	4848	1998	6412	4626

† Only 1-yr data, missing 2011.

Table 3. THREE-YEAR (30-TESTS) AVERAGE DISEASE INCIDENCE, POD YIELD, TSMK GRADE, SEED COUNT, AND DOLLAR VALUES OF 12 RUNNER-TYPE PEANUT VARIETIES AT MULTILOCATIONS IN GEORGIA, 2008-10.

Runner Variety	TSWV (%)	TD (%)	Yield (lb/a)	TSMK (%)	Seed (no./lb)	Value ($/a)
Georgia-10T	8	16	4294	77	694	811
Georgia-07W	9	19	4420	75	656	811
Georgia-06G	8	20	4396	75	645	805
*Georgia-09B	10	25	4239	74	737	771
Georgia Greener	10	22	4183	75	703	766
*Florida-07	16	30	4394	71	620	762
*Georgia-02C	11	23	4048	75	763	749
*McCloud	18	35	4045	72	643	717
Tifguard	13	26	3994	73	645	717
Georgia-03L	10	23	4112	70	677	714
AP-4	17	35	3926	72	665	705
Georgia Green	13	32	3668	73	811	663

* High-Oleic

Table 4. FIVE-YEAR (49 TESTS) AVERAGE DISEASE INCIDENCE, POD YIELD, TSMK GRADE, ELK GRADE, SEED COUNT, AND DOLLAR VALUES OF GEORGIA-08V VS. THREE OTHER VIRGINIA-TYPE PEANUT VARIETIES IN GEORGIA, 2006-10.

Virginia Variety	Disease (%)	Yield (lb/a)	TSMK (%)	ELK (%)	Seed (no./lb)	Value ($/a)
*Georgia-08V	30	4310	72	51	482	795
CHAMPS	43	3722	67	36	513	650
Gregory	43	3569	65	38	547	603
Perry	51	3369	68	36	562	596

* High-Oleic

Table 5. FOUR-YEAR (33 TESTS) AVERAGE DISEASE INCIDENCE, POD YIELD, TSMK GRADE, ELK GRADE, SEED COUNT, AND DOLLAR VALUES OF GEORGIA-11J VS. GEORGIA-08V AT MULTILOCATIONS IN GEORGIA, 2007-10.

Virginia Variety	Disease (%)	Yield (lb/a)	TSMK (%)	ELK (%)	Seed (no./lb)	Value ($/a)
*Georgia-11J	28	4311	71	54	425	782
*Georgia-08V	30	4531	72	51	465	833

* High-Oleic

Table 6. ELEVEN-YEAR AVERAGE YIELD, GRADE, SEED SIZE AND DOLLAR VALUE OF FIVE SPANISH-TYPE PEANUT VARIETIES IN GEORGIA, 2000-10.

Spanish Variety	Yield (lb/a)	TSMK (%)	Seed (no./lb)	Value ($/a)
*Georgia-04S	3848	71	1133	763
Tamspan 90	2851	66	1136	537
*OLin	2197	65	1182	404
Pronto	1903	65	1126	352
Spanco	1922	63	1177	343

* High-Oleic

Table 7. TEN-YEAR AVERAGE YIELD, GRADE, SEED SIZE AND DOLLAR VALUE OF FIVE VALENCIA-TYPE PEANUT VARIETIES IN GEORGIA, 2001-10.

Valencia Variety	Yield (lb/a)	TSMK (%)	Seed (no./lb)	Value ($/a)
Georgia Valencia	2571	58	803	407
Georgia Red	2040	63	981	356
N.M. Val. C.	1612	57	1204	254
Val. McRan	1629	55	1195	252
N.M. Val. A.	1537	54	1245	235

CULTIVAR OPTIONS FOR 2012

John P. Beasley, Jr.

Based on feedback from seed suppliers there will be seed of six peanut cultivars available for producers on a commercial basis in 2011. The cultivars available this year are: Georgia-06G, Georgia Greener, Tifguard, Florida-07, Georgia-07W, and Georgia-09BC. Seed supply of Georgia-09B will be very limited so the majority of the seed will come from the first five cultivars listed. Over 75% of the seed supply will be in Georgia-06G.There could possibly be very minimal amounts of AT 215 available from Golden Peanut.

According to figures from the Georgia Crop Improvement Association, the largest percentage of acreage planted in 2011 for seed production for 2012 was Georgia-06G with about 76% (Table 1 below). That was followed by Tifguard, Georgia-07W, and Georgia Greener at 6.2, 5.8, and 5.7%, respectively. This indicates we could expect 90 - 95% of the planted acreage in the Southeast U.S. in 2012 to be planted among those four cultivars. The table below (Table 1) provides the acreage planted in 2011 in Georgia for Foundation, Registered, and Certified seed supply in 2012.

Table 1. Acreage Planted in Georgia in 2011 to produce Foundation, Registered, and Certified Seed for 2012.

Cultivar	Acreage	% of Acreage
Georgia-06G	73,174	76.1
Tifguard	6,000	6.2
Georgia-07W	5,600	5.8
Georgia Greener	5,484	5.7
Florida-07	4,635	4.8
Georgia-09B	1,098	1.1
AT-215	124	
Georgia-10T	66	
TOTAL	96,181	

Source: Georgia Crop Improvement Association

The percentages change very slightly when you include acreage planted for seed production in Florida and Alabama. The table below (Table 2) includes the percentage of acreage only by cultivar.

Table 2. Percent of Acreage Planted in Georgia, Florida, and Alabama in 2011 to produce Foundation, Registered, and Certified Seed for 2012.

Cultivar	% of Acreage
Georgia-06G	73
Georgia-07W	7
Georgia Greener	7
Florida-07	5
Tifguard	5
Georgia-09B	2
AT-215	<1
Georgia-10T	<1

Source: Dr. Jim Bostick, Alabama Crop Improvement Association

The University of Georgia has released two new cultivars over the past two years. Georgia-09B was released in 2009 and Georgia-10T was released in 2010. As can be noted in the table above, acreage of these cultivars, especially Georgia-10T, is extremely limited. In fact DO NOT expect any commercial seed of Georgia-10T and not much of Georgia-09B as the seed of these two new cultivars will be dedicated to seed increase. The University of Florida announced the release of FloRun^{TM} '107' in 2010 but the seed supply of this new release still remains very limited and will be targeted toward Foundation and Registered seed increase in 2012 for developing a seed supply for 2013 .

What cultivar do I select?

What should producers look for in a cultivar when trying to decide which one or ones to plant on their farm? Obviously, the first characteristics a producer should look for in a cultivar are yield and grade. Fortunately, most, if not all, of the new cultivars that have been released over the past five years have a higher yield potential than Georgia Green, our standard from about 1996 till 2008. In the UGA Statewide Variety Trials and in small plot and on-farm large plot trials we have seen Georgia-06G, Florida-07, Tifguard, Georgia Greener, and Georgia-07W consistently out yield Georgia Green. Yield data for all these cultivars is available from the University of Georgia's Statewide Variety Test program at the following website: www.swvt.uga.edu. The grades of these cultivars, with the exception of Florida-07, have been equal to or better than Georgia Green. Grade data is also available from the same website.

Disease resistance is another important trait to look for in a cultivar. The reason Georgia Green was such a success when it was released in the mid 1990's was that it had a better level of resistance to spotted wilt disease, caused by tomato spotted wilt virus (TSWV) than the other cultivars that were being planted at that time. The peanut breeding programs in the southeast U.S. have released numerous cultivars the past 10 years with much better resistance to TSWV. Resistance to leaf spots, white mold, CBR, and peanut root- knot nematode now exist in one or more cultivars. If a producer has a field with a history of CBR, then Georgia Greener is the best option. Tifguard has near immunity to peanut root-knot nematode and should be the cultivar planted in fields with a history or large population of this pest. Utilize ***Peanut Rx*** and the Index Values to determine a cultivars level of disease resistance or tolerance as they compare to one another. This tool allows a producer to select a cultivar, or cultivars, based on the expected disease problem within a given field, based on expected field and environmental conditions.

Maturity range will also dictate if a producer wants to select a certain cultivar. Currently there is one early maturing cultivar, AT 215, but the seed supply on it will be extremely limited. It works well in a late planting situation like we experienced in 2011. Georgia Greener and Tifguard have what we call the "normal" or medium maturity range. In other words, under normal growing conditions in which there are no factors delaying or speeding up maturation, these cultivars are ready for harvest in 135-140 days after planting. Georgia-06G, Florida-07, and Georgia-07W all mature about 7-10 days later than Georgia Green. Our experience with Georgia-06G is that it can mature about the same as Georgia Greener and Tifguard and in some cases it matures about 7-10 days later, similar to Florida-07 and Georgia-07W. We will be closely evaluating the maturity range of Georgia-09B and FloRun™ '107' in 2012. As mentioned above, Georgia-10T was released in late 2010 and seed supply is extremely limited so we don't expect any commercially available seed in 2012. Based on input from Dr. Bill Branch, the UGA Peanut Breeder that developed and released Georgia-10T, it will be a late maturing cultivar, much like its two parents, Georgia-02C and Georgia-01R. We will update you on that status as we get another year's research on it under our belts.

Cultivar Maturity Ranges relative to Georgia Green (135-140 days after planting under normal growing conditions)

10-14 days early	Same as Georgia Green	7-10 days later
AT 215	Georgia Greener	Georgia-06G
	Tifguard	Florida-07
	Georgia-06G	Georgia-07W

Seed availability is another issue with selecting a cultivar. When a new cultivar is released there is usually a very limited supply of seed. It typically takes 2-3 years to build the seed supply of a new cultivar release before there is an adequate supply to meet producers' demands. For example, the University of Georgia released Georgia-09B in November 2009 and Georgia-10T in November 2010. There were only 1,098

acres of Georgia-09B and 66 acres of Georgia-10T planted for seed production in 2011. It will be at least another year, at least, before there is an adequate supply of seed of Georgia-09B available for commercial production. There will be a very, very limited commercially available seed supply in 2012. It could take several more years of seed increase of Georgia-10T to get this cultivar to a sufficient level of seed for commercial production. The same is true of the seed supply of FloRun™ '107'.

One other factor that might have a bearing on cultivar selection is seed size. Several of the new cultivar releases have considerably larger seed size than the average seed size of Georgia Green. These cultivars include Georgia-06G, Florida-07, Tifguard, and Georgia-07W. Their seed size results in it taking 30 or more pounds per acre to plant when sown at the same seed per foot of row rate as Georgia Green. For example, when planting Georgia Green at 6 seed per foot of row it typically requires 105-110 pounds per acre. At the same 6 seed per foot of row rate, Georgia-06G, Tifguard, Georgia-07W, and Florida-07 will end up planting 135+ pounds per acre. Based on the fact we could possibly seed seed costs at approximately $1.00 - $1.50 per pound, the cost for planting the large-seeded runner cultivars increases production costs significantly. One way to help reduce seed cost per acre is to lower the seeding rate on the single row pattern from 6 to 5 seed per foot of row. UGA research strongly supports planting high quality seed at 5 seed per foot of row with no yield reduction compared to 6 seed per foot of row. We DO NOT recommend reducing the seeding rate on twin rows from 3 to 2.5 seed per foot of row on each twin row.

PEANUT

Tifton, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Irrigated

Variety	Digging Date	Yield	TSMK	OK	DK	ELK	Seed	Fancy
		lb/A	%	%	%	%	no./lb	%
Spanish Types								
GA 082549[1]	09/30	**4870**	77.0	3.0	0.0	0.0	868	0.0
Georgia-04S	09/30	**4795**	74.5	4.0	0.5	0.0	1015	0.0
GA 082550[1]	10/17	**4779**	75.5	3.5	0.5	0.0	1066	0.0
GA 082548[1]	09/30	**4764**	75.5	3.5	0.0	0.0	966	0.0
GA 082554[1]	10/17	**4731**	76.5	3.0	0.5	0.0	1054	0.0
GA 082551[1]	10/17	**4577**	78.0	3.0	0.0	0.0	1079	0.0
GA 082552[1]	10/17	**4559**	76.0	4.5	0.0	0.0	1001	0.0
GA 082553[1]	10/17	**4426**	76.5	3.5	0.0	0.0	937	0.0
Georgia Browne	09/30	3966	72.5	6.0	0.0	0.0	1045	0.0
Tamspan 90	08/23	2883	62.0	9.0	0.0	0.0	1127	0.0
Tamnut OL06	08/23	2862	62.0	5.5	0.5	0.0	905	0.0
OLin	08/23	2333	64.0	6.5	0.5	0.0	1186	0.0
Pronto	08/12	2263	65.0	8.0	0.5	0.0	1182	0.0
Spanco	08/12	2217	63.0	7.0	1.0	0.0	1145	0.0
Average	09/21	3859	71.3	5.0	0.3	0.0	1041	0.0
LSD at 10% Level		494	3.3	2.4	-	-	98	-
C.V. %		16.1	2.9	20.0	-	-	5.0	-
Valencia Types								
Valencia McRan	08/12	1717	56.5	10.5	0.5	0.0	1173	0.0
Georgia Red	08/23	1716	61.5	8.5	0.5	0.0	966	0.0
N.M. Valencia A	08/12	1690	54.5	11.5	0.5	0.0	1165	0.0
N.M. Valencia C	08/12	1667	52.5	13.0	0.5	0.0	1176	0.0
H & W Valencia 136	08/12	1582	49.5	14.0	0.5	0.0	1241	0.0
Georgia Valencia	08/23	1558	48.5	8.0	5.0	0.0	910	0.0
Average	08/16	1655	53.8	10.9	1.3	0.0	1105	0.0
LSD at 10% Level		494	3.3	2.4	-	-	98	-
C.V. %		16.1	2.9	20.0	-	-	5.0	-

1. Advanced Georgia breeding line.

Bolding indicates entries not significantly different from highest yielding entry based on Fisher's protected LSD (P = 0.10).

Planted: May 9, 2011.
Seeding Rate: 6 seed/row foot in 36" rows.
Fertilization: 0 lb N, 0 lb P_2O_5, and 0 lb K_2O/acre.
Soil Test: P = High, K = High, and pH = 6.5.
Soil Type: Tifton sandy loam.
Previous Crop: Cotton.
Management: Disked, moldboard plowed and rototilled; Sonalan, Dual Magnum, Ultra Blazer and Basagran used for weed control; Provost, Folicur, Clorothilanil and Artisan used for fungal control; 1000 lb/acre Landplaster; irrigated 9 inches.

Test conducted by A. Coy, R. Brooke and D. Dunn.

Tifton, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Irrigated

Variety	Digging Date	Yield	TSMK	OK	DK	ELK	Seed	Fancy
		lb/A	%	%	%	%	no./lb	%
Runner Types								
GA 072531[1]	10/17	**6434**	73.5	3.5	0.5	0.0	723	0.0
GA 082546[1]	10/17	**6089**	77.0	3.5	0.0	0.0	891	0.0
GA 072716[1]	09/30	**6002**	75.5	3.5	0.0	0.0	792	0.0
FloRun™ '107'	09/30	5433	73.5	4.0	0.0	0.0	712	0.0
GA 082524[1]	10/17	5421	75.5	4.0	0.5	0.0	923	0.0
GA 072515[1]	09/16	5385	79.0	2.0	0.5	0.0	693	0.0
Georgia-06G	09/16	5345	77.0	2.0	0.5	0.0	623	0.0
GA 072514[1]	09/16	5276	82.0	1.0	0.0	0.0	705	0.0
Georgia-10T	10/17	5273	78.5	2.5	0.5	0.0	669	0.0
Florida-07	09/30	5260	72.5	2.5	0.0	0.0	585	0.0
Georgia Greener	09/16	5185	77.5	2.5	0.0	0.0	708	0.0
Georgia-07W	09/30	5115	76.0	2.5	0.5	0.0	688	0.0
GA 082522[1]	09/30	5106	75.0	5.0	0.0	0.0	828	0.0
Tifguard	09/16	5061	75.0	2.0	0.0	0.0	617	0.0
GA 072523[1]	09/16	4991	78.5	1.5	0.0	0.0	648	0.0
UF 10302[2]	09/16	4982	76.0	1.5	1.5	0.0	653	0.0
Georgia-09B	09/16	4949	77.0	2.0	0.0	0.0	721	0.0
Georgia-02C	09/30	4604	74.5	4.0	0.0	0.0	835	0.0
GA 082549[1]	09/30	4586	76.0	3.0	0.0	0.0	909	0.0
GA 082548[1]	09/30	4547	74.0	5.0	0.0	0.0	962	0.0
Georgia Green	09/16	4483	76.0	3.0	0.5	0.0	813	0.0
Average	09/27	5216	76.2	2.9	0.2	0.0	747	0.0
LSD at 10% Level		508	3.2	-	-	-	47	-
C.V. %		10.4	2.6	-	-	-	4.1	-
Virginia Types								
Georgia-08V	09/16	5376	71.5	2.0	3.0	61.5	466	89.5
CHAMPS	08/23	5212	72.5	1.5	0.0	42.5	478	86.5
Bailey	08/23	5200	69.0	3.5	0.0	40.0	508	86.5
Georgia-11J	10/17	5161	74.5	1.0	0.5	60.5	406	83.5
Gregory	08/23	4925	68.0	2.0	0.0	44.5	516	86.5
Sugg	08/23	4895	70.5	2.0	0.0	48.5	499	85.5
Florida Fancy	09/16	4668	69.5	1.5	0.0	45.0	500	84.5
Titan	08/23	4356	63.0	1.5	0.5	30.5	473	93.0
Perry	08/23	4280	68.5	3.5	0.0	33.5	551	76.0
Average	09/03	4897	69.7	2.1	0.4	45.2	488	85.7
LSD at 10% Level		508	3.2	-	-	5.7	47	5.7
C.V. %		10.4	2.6	-	-	24.7	4.1	10

Tifton, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Irrigated (Continued)

1. Advanced Georgia breeding line.
2. Advanced Florida breeding line.

Bolding indicates entries not significantly different from highest yielding entry based on Fisher's protected LSD (P = 0.10).

Planted:	May 9, 2011.
Seeding Rate:	6 seed/row foot in 36" rows.
Fertilization:	0 lb N, 0 lb P_2O_5, and 0 lb K_2O/acre.
Soil Test:	P = High, K = High, and pH = 6.5.
Soil Type:	Tifton sandy loam.
Previous Crop:	Cotton.
Management:	Disked, moldboard plowed and rototilled; Sonalan, Dual Magnum, Ultra Blazer and Basagran used for weed control; Provost, Folicur, Clorothilanil and Artisan used for fungal control; 1000 lb/acre Landplaster; irrigated 9 inches.

Test conducted by A. Coy, R. Brooke and D. Dunn.

Tifton, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Nonirrigated

Variety	Digging Date	Yield	TSMK	OK	DK	ELK	Seed	Fancy
		lb/A	%	%	%	%	no./lb	%
Runner Types								
Florida-07	10/28	**5364**	66.5	4.0	2.0	0.0	591	0.0
GA 072531[1]	10/28	**5282**	70.0	5.5	0.5	0.0	735	0.0
Georgia Greener	10/17	**5179**	70.5	5.5	1.0	0.0	731	0.0
Georgia-07W	10/28	**4924**	73.5	3.0	0.5	0.0	642	0.0
Georgia-10T	10/28	4725	69.0	6.0	3.0	0.0	700	0.0
Georgia-06G	10/17	4580	73.0	4.0	0.5	0.0	772	0.0
GA 072523[1]	10/17	4559	72.0	3.5	0.5	0.0	788	0.0
GA 082549[1]	10/28	4520	71.0	6.5	0.5	0.0	877	0.0
GA 072716[1]	10/28	4429	62.5	10.0	2.0	0.0	941	0.0
GA 082522[1]	10/28	4413	72.0	6.0	1.5	0.0	793	0.0
FloRun™ '107'	10/28	4383	68.5	6.5	1.5	0.0	738	0.0
Tifguard	10/17	4350	69.0	5.5	0.5	0.0	677	0.0
GA 072515[1]	10/17	4292	72.5	4.0	0.5	0.0	949	0.0
GA 082546[1]	10/28	4274	68.5	8.0	0.5	0.0	867	0.0
UF 10302[2]	10/17	4117	69.5	5.5	0.0	0.0	678	0.0
Georgia-09B	10/17	4029	68.0	7.0	0.5	0.0	777	0.0
Georgia Green	10/17	4013	69.0	6.5	1.0	0.0	833	0.0
GA 082548[1]	10/28	4005	71.0	5.0	1.0	0.0	926	0.0
Georgia-02C	10/28	4002	71.0	4.5	1.0	0.0	937	0.0
GA 072514[1]	10/17	3933	75.5	3.5	0.5	0.0	933	0.0
GA 082524[1]	10/28	3442	67.0	8.5	1.5	0.0	925	0.0
Average	10/23	4420	70.0	5.6	1.0	0.0	800	0.0
LSD at 10% Level		501	6.1	-	-	-	109	-
C.V. %		12.6	5.3	-	-	-	8.9	-
Virginia Types								
Georgia-11J	10/28	4779	64.5	3.0	0.5	43.5	523	74.5
Georgia-08V	10/17	4244	63.0	4.5	4.0	39.5	522	75.0
CHAMPS	09/16	3830	65.5	3.0	1.5	39.5	515	88.5
Gregory	09/16	3805	61.0	3.0	1.0	32.0	575	80.0
Bailey	09/16	3748	69.0	1.5	0.0	40.0	504	79.5
Sugg	09/16	3213	66.0	2.5	0.0	41.5	525	82.5
Florida Fancy	10/17	3198	58.5	5.0	2.0	25.5	566	72.0
Titan	09/16	3110	53.0	4.5	1.0	26.5	585	82.0
Perry	09/16	2287	67.5	2.5	1.0	39.0	553	69.5
Average	09/28	3579	63.1	3.3	1.2	36.3	541	78.2
LSD at 10% Level		501	6.1	-	-	6.5	109	6.5
C.V. %		12.6	5.3	-	-	3.8	8.9	16.3

Tifton, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Nonirrigated (Continued)

1. Advanced Georgia breeding line.
2. Advanced USDA breeding line.

Bolding indicates entries not significantly different from highest yielding entry based on Fisher's protected LSD (P = 0.10).

Planted:	May 10, 2011.
Seeding Rate:	6 seed/row foot in 36" rows.
Fertilization:	0 lb N, 0 lb P_2O_5, and 0 lb K_2O/acre.
Soil Test:	P = High, K = High, and pH = 5.8.
Soil Type:	Tifton loamy sand.
Previous Crop:	Corn and Grain Sorghum.
Management:	Disked, moldboard plowed and rototilled; Sonalan, Dual Magnum, Basagran, 24DB and Select used for weed control; Provost, Folicur, Clorothilanil and Artisan used for fungal control; 1000 lb/acre Landplaster.

Test conducted by A. Coy, R. Brooke and D. Dunn.

Plains, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Irrigated

Variety	Digging Date	Yield	TSMK	OK	DK	ELK	Seed	Fancy
		lb/A	%	%	%	%	no./lb	%
Runner Types								
GA 072716[1]	10/05	**6271**	73.0	4.5	0.0	0.0	852	0.0
Georgia-06G	10/05	**6207**	75.0	3.0	0.5	0.0	798	0.0
GA 082522[1]	10/05	5729	74.0	4.5	1.5	0.0	876	0.0
Georgia-07W	10/05	5554	76.0	3.0	0.0	0.0	658	0.0
FloRun™ '107'	10/05	5492	72.5	4.0	0.5	0.0	788	0.0
Georgia-02C	10/05	5469	74.5	3.5	0.0	0.0	776	0.0
Georgia-09B	10/05	5333	76.0	3.0	0.5	0.0	747	0.0
Georgia Greener	10/05	5236	77.0	4.5	0.0	0.0	725	0.0
Florida-07	10/05	5218	71.0	3.5	0.5	0.0	730	0.0
UF 10302[2]	10/05	5170	73.0	5.0	0.0	0.0	654	0.0
GA 072531[1]	10/26	5106	72.0	3.5	0.0	0.0	788	0.0
GA 072523[1]	10/05	5049	76.0	2.5	0.0	0.0	702	0.0
GA 072515[1]	10/05	5049	78.5	2.0	0.0	0.0	767	0.0
Georgia Green	10/05	4893	75.5	3.5	0.0	0.0	731	0.0
GA 072514[1]	10/05	4770	78.5	2.5	0.5	0.0	744	0.0
GA 082548[1]	10/05	4625	75.0	4.0	0.0	0.0	916	0.0
Tifguard	10/05	4532	73.5	3.5	0.5	0.0	724	0.0
GA 082546[1]	10/26	4513	73.5	5.5	0.0	0.0	935	0.0
GA 082524[1]	10/26	4389	77.0	3.5	0.0	0.0	831	0.0
GA 082549[1]	10/05	4356	76.0	3.0	0.0	0.0	961	0.0
Georgia-10T	10/26	4127	77.0	3.5	0.0	0.0	655	0.0
Average	10/09	5099	75.0	3.6	0.2	0.0	779	0.0
LSD at 10% Level		411	3.5	-	-	-	12.1	-
C.V. %		8.6	2.8	-	-	-	10.5	-
Virginia Types								
Georgia-08V	10/05	5757	75.0	1.0	0.5	61.0	404	86.5
Bailey	09/26	4907	72.0	1.5	0.0	47.5	501	85.5
Gregory	09/26	4819	66.5	3.5	0.0	38.5	447	89.5
Florida Fancy	10/05	4734	73.0	1.0	0.0	57.0	422	92.5
CHAMPS	09/26	4692	68.5	1.5	0.0	53.0	427	92.0
Sugg	09/26	4665	72.5	1.5	0.0	51.5	477	87.0
Perry	09/26	4365	71.5	2.0	1.0	48.0	477	77.0
Georgia-11J	10/26	4309	75.0	1.0	0.0	62.0	409	89.0
Titan	09/26	4105	69.0	2.5	1.5	48.0	436	93.0
Average	10/01	4706	71.4	1.7	0.3	51.8	444	88.0
LSD at 10% Level		411	3.5	-	-	5.3	12.1	2.2
C.V. %		8.6	2.8	-	-	20	10.5	5

Plains, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Irrigated (Continued)

1. Advanced Georgia breeding line.
2. Advanced USDA breeding line.

Bolding indicates entries not significantly different from highest yielding entry based on Fisher's protected LSD (P = 0.10).

Planted:	May 19, 2011.
Seeding Rate:	6 seed/row foot in 36" rows.
Fertilization:	0 lb N, 0 lb P_2O_5, and 0 lb K_2O/acre.
Soil Test:	P = High, K = Very High, and pH = 5.9.
Soil Type:	Greenville loamy sand.
Previous Crop:	Corn.
Management:	Disked, moldboard plowed and rototilled; Valor, Strongarm and Sonalan used for weed control; Lorsban used for insect control; Provost used for fungal control; 1000 lb/acre lime; irrigated 10 inches.

Test conducted by A. Coy, R. Brooke, D. Dunn and R. Pines.

Plains, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Nonirrigated

Variety	Digging Date	Yield	TSMK	OK	DK	ELK	Seed	Fancy
		lb/A	%	%	%	%	no./lb	%
Runner Types								
GA 072716[1]	10/26	**3987**	68.5	7.0	0.0	0.0	910	0.0
Georgia-07W	10/26	**3910**	70.5	4.0	0.0	0.0	764	0.0
Georgia-06G	10/26	**3815**	70.5	4.5	0.0	0.0	683	0.0
Georgia-09B	10/26	**3582**	71.5	4.5	0.0	0.0	762	0.0
FloRun™ '107'	10/26	**3570**	69.5	6.0	0.0	0.0	904	0.0
GA 082522[1]	10/26	**3554**	74.0	5.0	0.0	0.0	833	0.0
GA 072531[1]	10/26	3503	65.5	7.0	0.0	0.0	781	0.0
GA 082549[1]	10/26	3503	72.5	4.0	0.0	0.0	993	0.0
Florida-07	10/26	3481	67.0	6.0	0.0	0.0	747	0.0
Georgia-02C	10/26	3458	69.0	5.5	0.0	0.0	820	0.0
GA 072523[1]	10/26	3395	74.5	2.0	0.0	0.0	759	0.0
GA 072515[1]	10/26	3358	73.5	3.0	0.0	0.0	760	0.0
Georgia Greener	10/26	3307	73.5	3.5	0.5	0.0	758	0.0
GA 072514[1]	10/26	3260	73.0	5.0	0.0	0.0	785	0.0
UF 10302[2]	10/26	3246	71.5	3.5	0.0	0.0	712	0.0
Tifguard	10/26	3140	70.5	4.5	0.0	0.0	688	0.0
GA 082548[1]	10/26	3140	71.5	5.0	0.0	0.0	1070	0.0
GA 082524[1]	10/26	3010	72.0	5.0	0.0	0.0	879	0.0
GA 082546[1]	10/26	2983	71.0	5.5	0.0	0.0	748	0.0
Georgia Green	10/26	2964	69.0	7.0	0.0	0.0	839	0.0
Georgia-10T	10/26	2849	73.5	4.5	0.0	0.0	726	0.0
Average	10/26	3382	71.0	4.9	0.0	0.0	806	0.0
LSD at 10% Level		439	2.7	-	-	-	98	-
C.V. %		13.8	2.2	-	-	-	8.0	-
Virginia Types								
Georgia-08V	10/26	**3673**	72.5	1.5	0.0	45.5	499	74.5
Sugg	10/05	**3639**	70.5	3.0	0.5	47.5	471	76.0
Gregory	10/05	**3582**	67.5	2.5	1.0	51.0	488	87.0
CHAMPS	10/05	3518	68.5	2.5	0.5	34.0	478	83.5
Bailey	10/05	3319	66.5	4.0	0.0	19.5	584	69.0
Georgia-11J	10/26	2955	68.5	2.5	0.5	43.5	535	64.0
Perry	10/05	2929	71.0	3.0	0.0	33.5	529	60.5
Titan	10/05	2716	62.0	2.0	1.0	41.5	454	90.5
Florida Fancy	10/26	2384	67.0	3.0	0.0	28.5	575	72.5
Average	10/12	3190	68.2	2.7	0.4	38.3	512	75.3
LSD at 10% Level		439	2.7	-	-	4.1	98	6.7
C.V. %		13.8	2.2	-	-	20.9	8.0	17.4

Plains, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Nonirrigated (Continued)

1. Advanced Georgia breeding line.
2. Advanced USDA breeding line.

Bolding indicates entries not significantly different from highest yielding entry based on Fisher's protected LSD (P = 0.10).

Planted:	May 23, 2011.
Seeding Rate:	6 seed/row foot in 36" rows.
Fertilization:	0 lb N, 0 lb P_2O_5, and 0 lb K_2O/acre.
Soil Test:	P = High, K = Very High, and pH = 5.9.
Soil Type:	Greenville loamy sand.
Previous Crop:	Cotton.
Management:	Disked, moldboard plowed and rototilled; Valor, Strongarm and Sonalan used for weed control; Lorsban used for insect control; Provost used for fungal control.

Test conducted by A. Coy, R. Brooke, D. Dunn and R. Pines.

Midville, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Irrigated

Variety	Digging Date	Yield	TSMK	OK	DK	ELK	Seed	Fancy
		lb/A	%	%	%	%	no./lb	%
Runner Types								
GA 072716[1]	10/17	**7556**	77.0	3.5	0.0	0.0	812	0.0
GA 072531[1]	10/17	**7458**	76.0	2.0	0.0	0.0	749	0.0
Georgia-07W	10/17	**7161**	77.5	3.0	0.0	0.0	658	0.0
FloRun™ '107'	10/17	6912	76.5	2.5	0.0	0.0	674	0.0
Georgia-09B	10/01	6888	76.5	2.0	0.0	0.0	648	0.0
GA 072515[1]	10/01	6864	78.0	2.5	0.0	0.0	694	0.0
Georgia-06G	10/01	6814	77.0	2.0	0.5	0.0	592	0.0
GA 082524[1]	10/17	6785	77.0	2.5	0.0	0.0	804	0.0
Tifguard	10/01	6768	74.5	3.0	0.0	0.0	606	0.0
GA 082522[1]	10/17	6767	78.0	4.0	0.0	0.0	799	0.0
Florida-07	10/17	6707	74.0	3.0	0.0	0.0	628	0.0
Georgia Greener	10/01	6590	77.0	1.5	0.0	0.0	663	0.0
GA 082546[1]	10/17	6583	76.5	2.5	0.0	0.0	838	0.0
Georgia-10T	10/17	6458	80.5	1.5	0.0	0.0	671	0.0
GA 082549[1]	10/17	6367	77.0	2.5	0.0	0.0	808	0.0
GA 072514[1]	10/01	6357	79.5	2.5	0.0	0.0	713	0.0
GA 072523[1]	10/01	6248	78.5	1.5	0.0	0.0	677	0.0
UF 10302[2]	10/01	6189	76.0	3.0	0.0	0.0	649	0.0
GA 082548[1]	10/17	6088	75.5	4.5	0.0	0.0	943	0.0
Georgia-02C	10/17	5994	75.0	3.0	0.5	0.0	766	0.0
Georgia Green	10/01	5919	76.0	3.5	0.0	0.0	796	0.0
Average	10/10	6642	76.8	2.7	0.0	0.0	723	0.0
LSD at 10% Level		584	2.5	-	-	-	57	-
C.V. %		9.7	2.0	-	-	-	5.2	-
Virginia Types								
Georgia-11J	10/17	7239	76.5	1.0	0.0	60.0	412	85.0
Georgia-08V	10/01	6637	75.0	1.5	0.5	56.0	504	71.0
Florida Fancy	10/01	6014	72.0	2.0	0.5	47.0	495	73.0
Gregory	09/19	5285	70.5	1.5	0.5	58.0	448	90.0
Sugg	09/19	4851	71.5	3.0	0.0	43.5	495	82.0
Bailey	09/19	4834	72.0	3.0	0.5	48.0	500	84.5
CHAMPS	09/19	4795	73.5	1.5	0.5	48.0	468	84.5
Titan	09/19	4784	69.0	1.0	0.5	49.5	420	88.0
Perry	09/19	4637	71.5	2.5	0.0	37.5	503	80.5
Average	09/25	5453	72.4	1.9	0.3	49.7	472	82.1
LSD at 10% Level		584	2.5	-	-	3.6	57	2.7
C.V. %		9.7	2.0	-	-	14.2	5.2	6.4

Midville, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Irrigated (Continued)

1. Advanced Georgia breeding line.
2. Advanced USDA breeding line.

Bolding indicates entries not significantly different from highest yielding entry based on Fisher's protected LSD (P = 0.10).

Planted:	May 12, 2011.
Seeding Rate:	6 seed/row foot in 36" rows.
Fertilization:	0 lb N, 0 lb P_2O_5, and 0 lb K_2O/acre.
Soil Test:	P = High, K = Very High, and pH = 5.8.
Soil Type:	Tifton sandy loam.
Previous Crop:	Corn.
Management:	Disked, moldboard plowed and field conditioned; Sonalan, Valor, Acumen, Gramoxone, Storm and Duel used for weed control; Headline, Folicur, Convoy and Chlorothalonil used for fungal control; 1000 lb/a Dolemite Lime and 1000 lb/a Gypsum; irrigated 15 inches.

Test conducted by A. Coy, R. Brooke, D. Dunn, K. Cobb and R. Milton.

Midville, Georgia:
Yield and Grade Performance
Peanut Variety Trial, 2011, Nonirrigated

Peanut varieties were planted at this location on May 12, 2011 in a nonirrigated test. However, extensive damage throughout the growing season from lack of rainfall, high temperatures and droughty growing conditions resulted in a peanut crop not useful for performance evaluation.

Test conducted by A. Coy, R. Brooke, D. Dunn, K. Cobb and R. Milton.

Saving Peanut Seed: What Do I Need to Know?

John Beasley

There is a tremendous amount of interest by producers in saving their own seed to plant the 2012 peanut crop. There several factors producers must consider before saving seed.

LEGAL ISSUES – The very first, and most important, factor is whether or not it is legal for a producer to save seed. According to federal seed laws (Plant Variety Protection Act of 1970, amended in 1994) any cultivar that carries a patented trait CAN NOT be saved for seed by a producer. Examples of patented traits that most producers are familiar with include the bT gene in cotton and other crops, RoundUp Ready, Widestrike, and Liberty Link technologies. The only patented trait in peanut is the high oleic oil chemistry / low linoleic oil chemistry, better known as "High O/L" peanuts. The University of Florida owns the patents on the high oleic oil chemistry. If ANY peanut cultivar has the "High O/L" trait then it is ILLEGAL to save seed of those cultivars. Currently available "High O/L" peanut cultivars are: **Florida-07, Georgia-09B, Georgia-02C,** and the most recent release from the University of Florida, **FloRun™ '107'**.

The remaining peanut cultivars are also covered by federal seed laws (Plant Variety Protection Act of 1970, amended in 1994), better known as PVP cultivars. Under federal seed laws a grower can save seed of a PVP cultivar harvested from his own farm and re-plant them the following year, but it is ILLEGAL for a producer to sell those seed. This includes to family members. There can not be an exchange of money for the seed.

Bottom Line – It is illegal to save seed of Georgia-02C, Florida-07, Georgia-09B, or FloRun™ '107'. A producer can save seed of any of the other cultivars for planting on their own farm but can not sell the seed to anyone else.

PRODUCTION ISSUES - EVERY field grown for seed should be grown under IRRIGATION and have CALCIUM applied in the form of gypsum. It has been documented many times over the importance of calcium to seed germination. The University of Georgia recommendation for seed production is that every field has gypsum applied. The other critical factor is water. You can have sufficient calcium in the pegging zone but if there is not enough water to help move that calcium into the developing pod, the seed will not have enough calcium for good germination. Therefore, all peanuts grown for seed should be grown under irrigation – sufficient irrigation for maximum yield and quality (grade).

In addition to calcium (gypsum) and irrigation, every field grown for seed production should be managed for maximum yield and quality. This also includes pest management. If insects, diseases, and weeds are allowed to proliferate, they can reduce quality of the seed.

HARVEST – You can make or break seed quality with poor decisions at harvest. You can apply gypsum, irrigate, and manage all pests but if you make poor decisions at harvest, or if you are untimely with harvest operations, seed quality can be greatly reduced. Fields grown for seed MUST be allowed to reach physiological maturity. If fields are harvested too soon or too late, germination could be greatly reduced.

If seed moisture is allowed to drop below 10%, the germination can be compromised. Ideally, fields grown for seed should be allowed to dry, or cure, slowly from 18 down to about 12 percent. Drying too fast or too long can cause skin slippage and seed splitting. If peanuts grown for seed are cured on trailers, great care should be taken to bring the moisture content down slowly. This means monitoring the temperature very closely while peanuts are on trailers.

POST-HARVEST – Seed quality can only be maintained after harvest, not improved. Peanuts being saved for seed must be stored and warehoused in a well-conditioned and ventilated warehouse. Temperature and humidity fluctuations must be minimized. It is much easier for seed quality to drop than to hold steady, especially if not warehoused properly. You can't just leave peanuts in a trailer, toss a tarp over them and expect quality to remain high given the typical winter conditions in Georgia. Our maximum temperature during the winter months can go from 70's and 80's on one day and in the 30's a few days later. Humidity can be near 100 percent one day and in the 30's a few days later. These wide fluctuations in temperature and humidity can cause peanut quality to deteriorate quickly. If stored in a well-ventilated facility, the temperature and humidity fluctuations can be minimized.

Indian meal moth can cause serious damage on seed peanuts in storage. It is imperative that insect control measures be taken on all peanuts saved for seed. Germination can be dramatically reduced by Indian meal moth and other stored product insects.

Another of post-harvest handling of peanuts grown for seed is that they must be shelled, screened, treated, and bagged by an experienced seedsman. A producer saving their own seed will need to seek out and secure someone who is experienced in handling seed for shelling, treating, and bagging. This will cost money and must be figured into the cost toward the seed. Following bagging, the seed must be stored in a cool, dry location until time to plant.

In summary, producers with little or no experience in saving seed can end up with serious stand problems the following year if peanuts are not grown, harvested, stored, and treated properly.

Update on Seeding Rates Depending on Row Pattern

R. Scott Tubbs and John P. Beasley

In 2012, an increase in seed cost is expected. Seed is one of the largest input costs associated with peanut production, but is a worthwhile expense compared to planting farmer-saved seed in most cases, in order to ensure a solid plant stand and a healthy crop from the start. In a year where seed prices increase, there comes a great temptation to save on seed costs by planting saved seed from the previous season. However, purchasing quality seed that has followed production certification guidelines and managing this seed appropriately will actually improve profits compared to planting saved seed in many cases. Coming out of a hot and dry production season like last year, most farmer-saved seed will not have met the input requirements needed to cultivate a quality seed crop, which can lead to viability issues and cause poor germination the next year. In turn, this can lead to stand problems that could mean yield and grade reduction, or require replant situations which will cost both time and money to rectify something that could have been a non-factor from the start if high quality seed was used initially.

Research on recently released runner peanut varieties that will constitute a large percentage of the planted acreage in the Southeast have been conducted over the last few years to determine seeding rates needed to generate optimum plant stands. When quality seed are planted and good planting practices are used, the seeding rate will usually directly affect final plant stands, with higher seeding rates resulting in denser plant stands and lower seeding rates ending with sparser plant stands. This is often due to plant competition for space, light, water, nutrients, and other beneficial resources that are needed to maximize yield potential. This intra-row competition plays a large role in maximizing peanut stands and yields, and its magnitude will differ depending on whether peanuts are planted in single rows or in twin rows.

With single row peanut, assuming a 6 seed per foot of row (SPF) planting density in a linear row, each peanut seed will be placed 2 inches apart. Yet in the twin row pattern, half of the seed are moved out of this linear row into an adjacent parallel row spaced approximately 7 to 9 inches away from the original row. Therefore, at the same 6 SPF seeding rate, no peanut seed will be placed any closer than 4 inches from the nearest seed. The increased competition in single rows result in greater plant mortality as weaker plants are not given the opportunity to get established. Additional factors are influenced by row pattern and plant population such as diseases like tomato spotted wilt virus and southern stem rot/white mold, but further discussion on how they affect disease incidence can be found in the Peanut Rx chapter within this document.

Using values calculated from the University of Georgia (UGA) Statewide Variety Testing Program, large-seeded varieties such as Georgia-06G, Florida-07, and Tifguard (which will account for a large portion of the planted acreage in 2012) average between 620-650 seed per pound. Therefore, when planting at the UGA Extension recommended rate of 6 SPF, approximately 133-140 pounds of seed per acre are

planted with these varieties. Picking an arbitrary seed price of $1.00 per pound, this will cost up to $140 per acre in seed cost alone. For each 1 SPF that this seeding rate is adjusted, it would alter seed cost by $22-24 at the aforementioned price. Therefore, in order to maximize profit, it is essential to only plant the amount of seed that will maximize plant stand and yield potential. Increasing plant stand through higher seeding rates that only result in a minor yield increase can actually cost more money in seed cost than is gained from additional yield. Naturally, the contracted price of peanut will also play a role in these economics, but increased yield will not always mean higher profit.

Experiments

To determine the effect of various seeding rates on varieties in both single and twin rows, multiple experiments have been conducted in South Georgia. At the Southwest Georgia Research and Education Center in Plains, GA, a trial was conducted in 2008 and 2009 to evaluate seven peanut varieties using three seeding rates (5.2 SPF, 6.1 SPF, and 7.0 SPF) in both single and twin row patterns. The varieties tested in this location included Georgia Green, Florida-07, Georgia-06G, Tifguard, Georgia-03L, AP-3, and AT 3085RO. Another trial comparing single and twin rows at three seeding rates (5.1 SPF, 5.7 SPF, and 6.0 SPF) was conducted in 2010 and 2011 in Tifton, GA evaluating what should be some of the most commercially relevant runner varieties available in the southeast over the next several years. These included Georgia-06G, Georgia-09B, Georgia Greener, '27-1516' (unreleased advanced breeding line), FloRun™107, and Georgia-07W in 2010 but replaced with Florida-07 in 2011. Another experiment was conducted at the Attapulgus Research and Education Center in Attapulgus, GA during 2008 and 2010, which compared five seeding rates (5.2 SPF, 6.2 SPF, 7.1 SPF, 8.3 SPF, and 8.9 SPF), but only in twin row pattern.

Yield

These results are reported based on the row pattern x seeding rate treatment factor interactions for the sake of consistency. This does not necessarily mean a statistical interaction was observed in all cases, but reporting the data in this manner shows trends in the results from different experiments which cannot be combined for statistical reasons. In Figures 1 and 2, yield results are displayed for the various seeding rates in single and twin row patterns. At Plains, GA in 2008, yields were higher in twin rows than in single rows regardless of seeding rate or variety (twin = 5504 lb/ac; single = 5020 lb/ac), but it can be seen in Figure 1 that there was little difference in yield at the three seeding rates in single rows, while there was a slight dip in yield at the lowest seeding rate (5.2 SPF) for twin rows, albeit this was not a statistical difference. This is an example of where a minor yield increase can actually be detrimental economically. In the single row pattern in 2008, there was close to a 100 lb/ac yield increase, but assuming the $1.00 / lb seed price and an estimated $600 / ton contract price for peanuts, the 5.2 SPF seeding rate would have resulted in higher net revenue ($13 / acre) than if he/she had planted in single rows at the 7.0 SPF rate. In 2009 at Plains, GA there was again a significant difference in yield between row patterns regardless of seeding rate and variety (twin = 4591 lb/ac; single = 4307 lb/ac). However, when broken out by row pattern, it can again be observed in Figure 1 that

there was only a minor fluctuation in yields in single row pattern, but a larger gap in yield existed between the low seeding rate (5.2 SPF) and the highest yielding rate (7.0 SPF) in twin rows. This would have resulted in essentially no difference in revenue between the 5.2 and 6.1 SPF seeding rates in single rows, with both netting nearly $50 / acre more than at the 7.0 SPF rate.

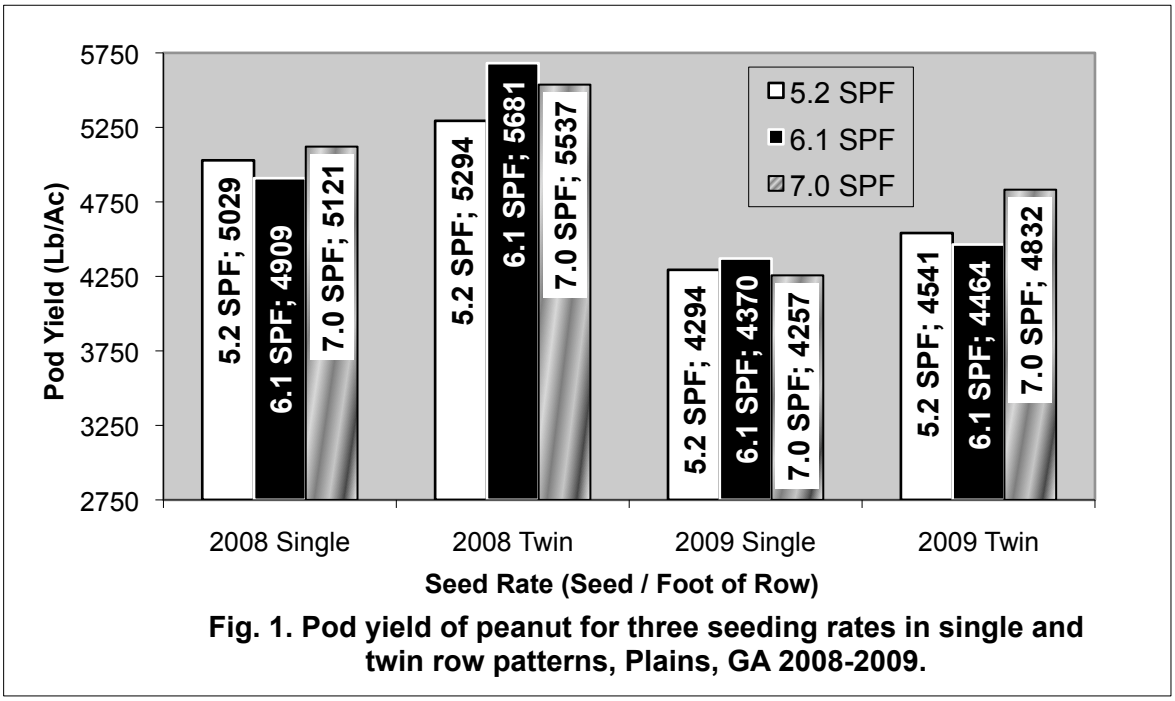

Fig. 1. Pod yield of peanut for three seeding rates in single and twin row patterns, Plains, GA 2008-2009.

With the newer cultivars at Tifton in 2010 and 2011, there was not a pronounced difference between single and twin row patterns. But a similar seeding rate trend within each row pattern could be seen here as occurred in Plains in 2008-2009. Very little separation occurred in single row pattern while the low seeding rate (5.1 SPF) was slightly suppressed in comparison to the higher rates in twin rows (Fig. 2). This again did not translate to a statistical difference, but the consistent trend being observed in all cases is that there is a greater concern over yield reduction by decreasing seeding rate in twin row pattern than doing so in single row pattern. Using the same price values as above, the 5.1 SPF rate produced the most revenue in single row pattern in both years, with an average of $37 / acre increase over the 6.0 SPF rate. However, there was close to a $30 / acre reduction in revenue when dropping from 6.0 SPF to 5.1 SPF in the twin row pattern.

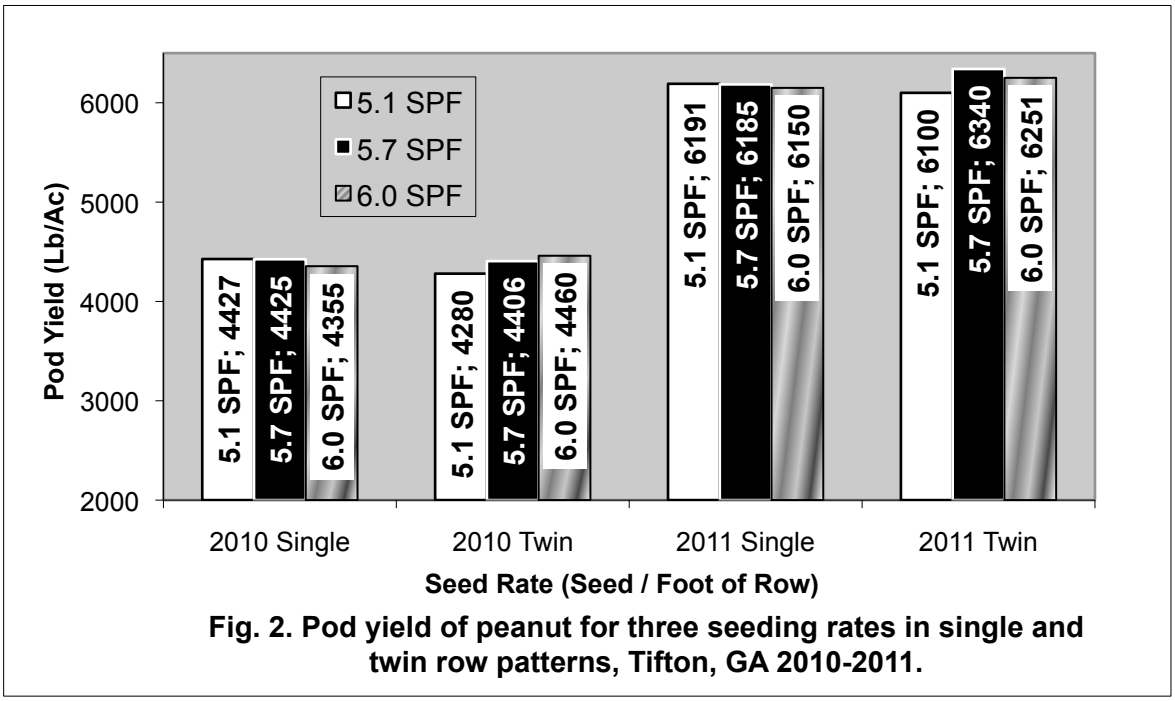

Fig. 2. Pod yield of peanut for three seeding rates in single and twin row patterns, Tifton, GA 2010-2011.

Relationship with Plant Stand

Yields can be directly affected by plant stand, but a denser stand does not necessarily mean a higher yield will be achieved. As previously discussed, by spreading out the placement of seed in the field with a twin row pattern, plant stands tend to be denser than in single row pattern at an equivalent seeding rate, for two primary reasons. Spreading the plants out causes less competition and thus lower plant mortality. However, the seed plates at planting also have to spin more rapidly in single row pattern than in twin row pattern, which causes more skips merely due to equipment error. Final plant stands from these experiments display the differences between row patterns very definitively (Figs. 3 and 4). However, it can likewise be noted that the reduction in final plant stand is not as drastic in single row pattern as it is in twin row pattern when going from the recommended seeding rate of 6 SPF down to around 5 SPF. In all four years of these experiments combined, there was an average stand reduction of just under 0.3 plants / foot of row in single row pattern when seed rate was reduced from around 6 SPF to 5 SPF while there was an average stand reduction of just over 0.6 plants / foot in twin rows at the same seeding rates. This is partially because plants have already thinned themselves in single row pattern, and there is a plateau for maximum plant stand within a row that usually occurs between 4 and 5 plants / foot in a linear row for peanut.

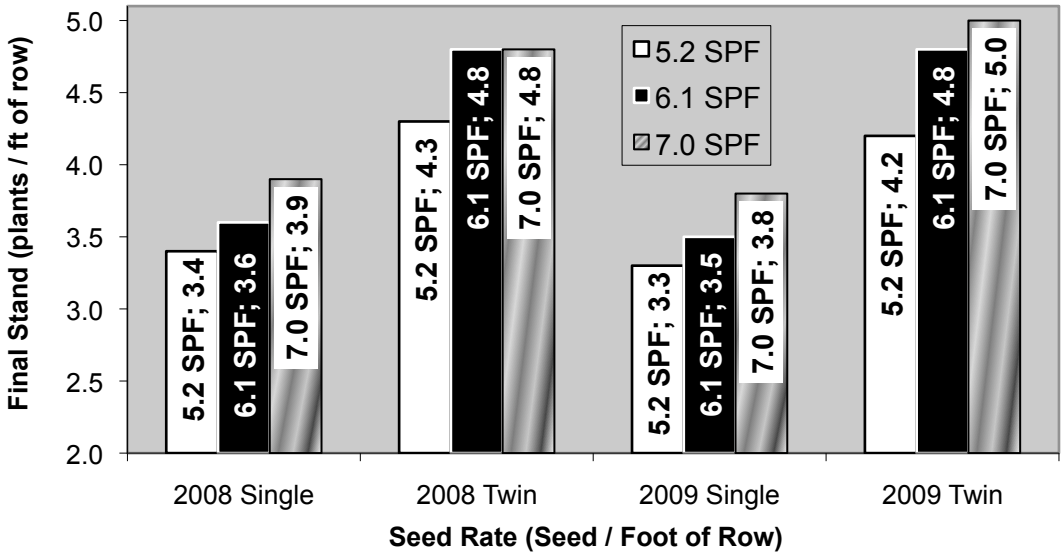

Fig. 3. Final plant stand of peanut for three seeding rates in single and twin row patterns, Plains, GA 2008-2009.

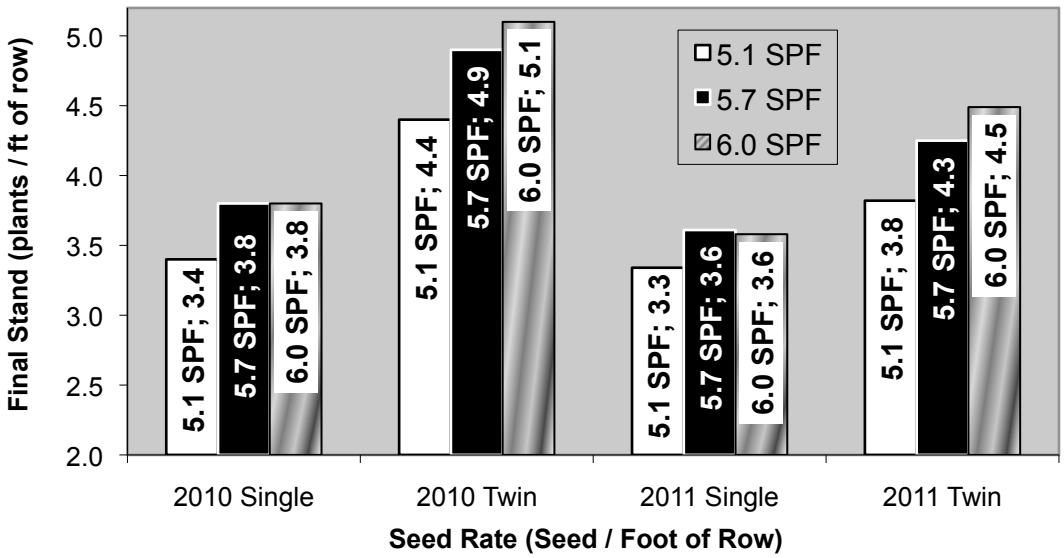

Fig. 4. Final plant stand of peanut for three seeding rates in single and twin row patterns, Tifton, GA 2010-2011.

However, since it is ultimately final plant stand that determines yield potential and not the seeding rate itself, a closer look at the relationship between final plant stand and yield is warranted. In each of these experiments, every individual plot was graphed with a scatter plot to show yield at the corresponding final stand. Then a 2nd order polynomial (non-linear) trendline was fit through these plotted values to view relationships to help evaluate the optimum range of stands for maximum yield in either single or twin row pattern (Figs. 5-8). Based on those trends, seeding rates can be

adjusted to try and achieve a given plant stand. Unfortunately, it is impossible to know what the final plant stand will be at the time of planting, so a seeding rate must be chosen that when coupled with good planting practices will give the greatest opportunity for final plant populations to settle into the optimum range.

For the single row pattern, yields are maximized between 3.0 and 4.0 plants / foot of row. In Figures 5 and 8, the trendlines have little curve to them and have very small variation in maximum and minimum yield between the broad range of plant densities. However, in Figures 6 and 7, there is a larger curve associated with the trendline, with a maximum yield occurring near 3.5 plants / foot, and a tendency to decline in yield when plant populations rise above 4.0 plants / foot of row. In twin rows, plant densities were much greater overall compared to single rows, and yields continued to increase at much higher plant populations. In Figure 5, the trendline did not plateau at high plant populations. However, in the other three graphs, the trendline did reach a maximum and level out or perhaps even start to decline slightly at the highest plant populations. Optimum plant stands for maximized yields in Figs. 6-8 appear to suggest a plant stand near 4.5 plants / foot is ideal.

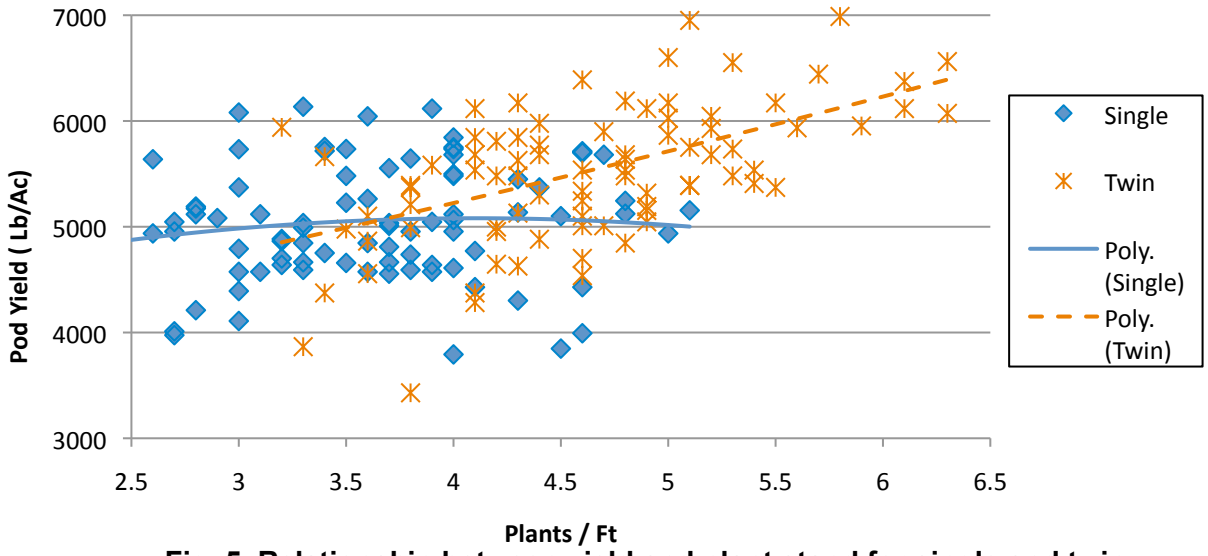

Fig. 5. Relationship between yield and plant stand for single and twin row patterns, Plains, GA 2008.

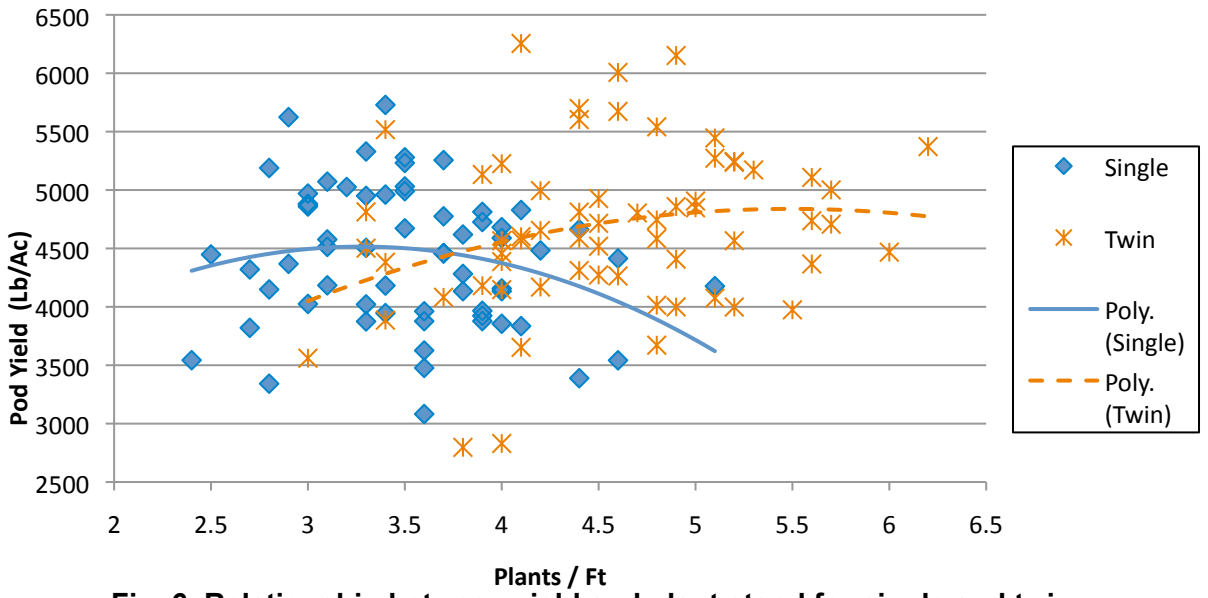

Fig. 6. Relationship between yield and plant stand for single and twin row patterns, Plains, GA 2009.

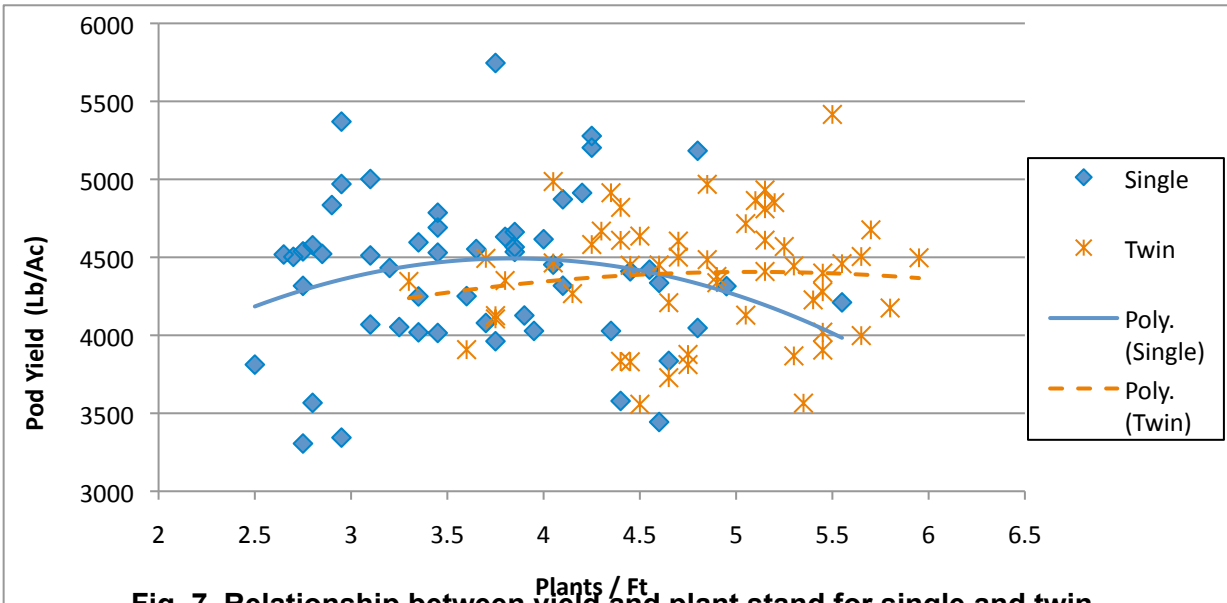

Fig. 7. Relationship between yield and plant stand for single and twin row patterns, Tifton, GA 2010.

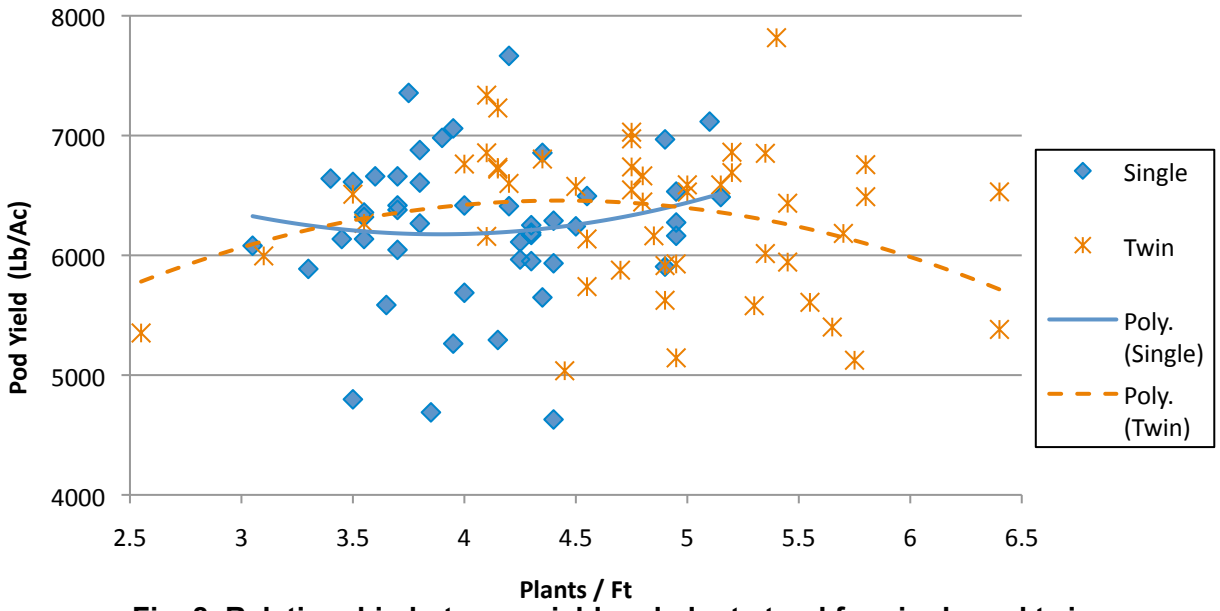

Fig. 8. Relationship between yield and plant stand for single and twin row patterns, Tifton, GA 2011.

Much higher seeding rates were used in the Attapulgus location on twin row pattern only to determine if recommended seeding rates might be too low for twin row plantings. Data from Figure 5 would suggest that higher plant populations were needed in twin rows to reach a maximum yield trend. In both years at the Attapulgus location, yields were not increased at seeding rates above the UGA Extension recommended rate of 6.0 SPF. However, when viewed using the stand vs yield scatter plot (Figs. 9 and 10), yields did continue to increase slightly at plant populations above 6.0 SPF, which would indicate that the 6.0 SPF seeding rate would be too low for maximized yield potential and there would be the potential for an economic gain from planting at a higher seeding rate. However, yields did plateau (Fig. 9) or decline (Fig. 10) above 6.5 plants / foot. Thus, planting at extremely high seeding rates, even in twin row pattern, do have a threshold for plant population where a maximized profit potential will be reached.

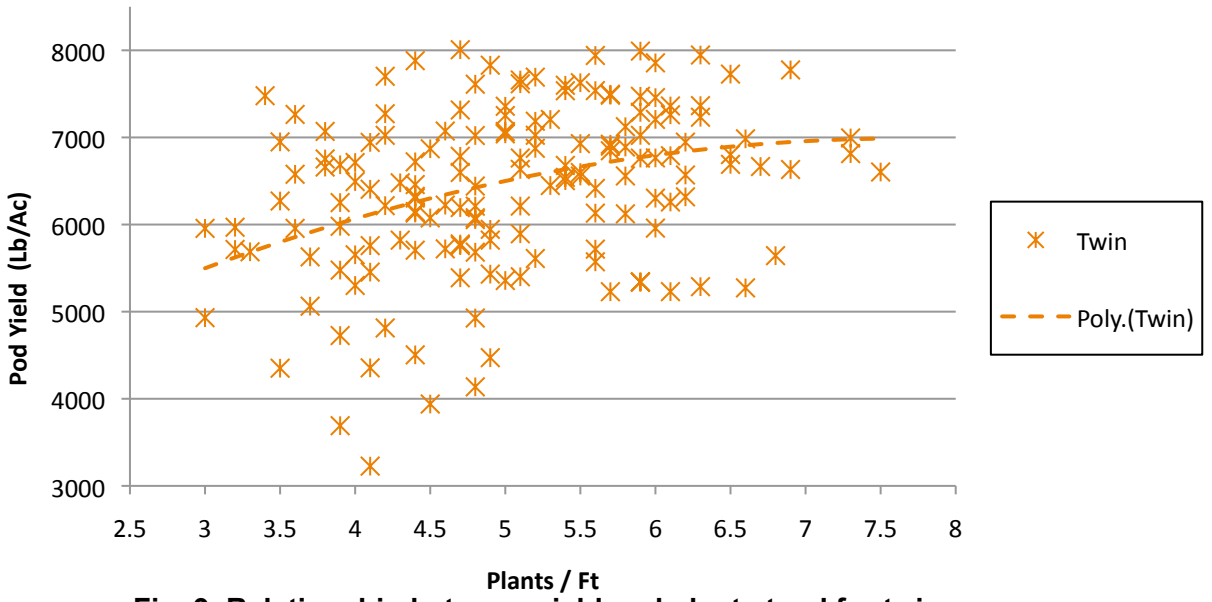

Fig. 9. Relationship between yield and plant stand for twin row pattern, Attapulgus, GA 2008.

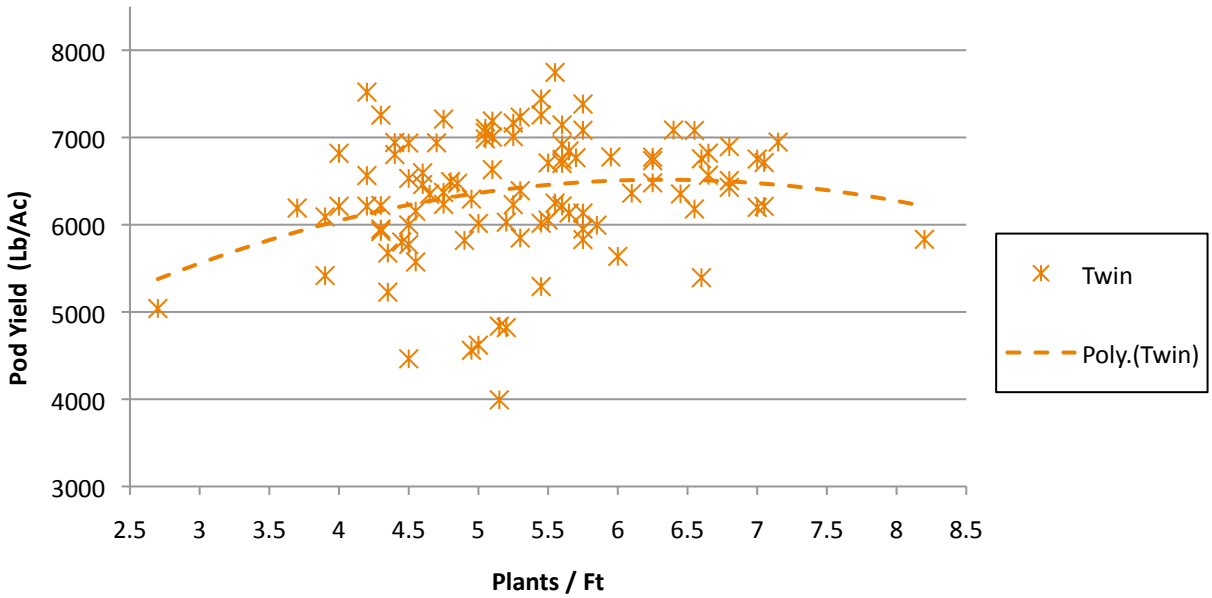

Fig. 10. Relationship between yield and plant stand for twin row pattern, Attapulgus, GA 2010.

Summary

UGA Extension recommendations are to achieve a final plant stand of around 4 plants per foot of row. These data tend to defend that claim on average, although it appears from these results that if planting in single row pattern, a lower plant stand can still achieve maximized yield and net revenue, while a higher plant stand is needed in twin row pattern in order to reach best profit potential. These results suggest that a reduction in seeding rate to as low as around 5 SPF would be possible to achieve a

plant stand within the desired range of around 3.5 ± 0.5 plants per foot. Yet in twin row pattern, data has shown that plant stands have a tendency to plateau when seeding rates go above 7.0 SPF, although the maximized yield potential is apparently at least 4.5 plants per foot, while some of the data suggest as high as 6.0 plants per foot (3 plants per twin).

It may seem counter-intuitive to reduce seeding rates in single rows but not in twin rows when single rows already result in a lower plant stand by nature of plant competition. However, knowing that increasing plant stand does not automatically mean increased yields, especially at very dense populations, it becomes critical to only plant the amount of seed necessary to optimize plant stand. Anything above that level is a waste of seed since it will not result in improved yields, and will only end up reducing net profit. This is true regardless of whether planting in single or twin row pattern, although the final plant stand needed to achieve maximized yield and revenue potential does appear to differ depending on whether single or twin rows are utilized. Based on these results, when planting high quality seed (foundation, registered, or certified) and following UGA Extension recommendations for planting (good moisture and soil temperatures above 67 degrees F at the 4 inch depth), seeding rates between 5-6 SPF in single row pattern and seeding rates between 6-7 SPF in twin row pattern (3.0 to 3.5 seed per twin) should provide adequate plant stands in most planting conditions.

Planting Dates

John Beasley

The last few years we have seen cooler than normal weather in mid to late October slow or completely stop peanut maturation. This has been especially problematic for fields planted after the end of May.

Since the middle to late 1990's, we encouraged peanut producers to delay planting in order to help reduce their risk of tomato spotted wilt virus (TSWV). The sacrifice was that we ended up planting many fields well into June. June planted fields are at risk of cool, or cold, temperatures slowing pod maturation to the point the most mature pods never reach physiological maturity. This reduces yield and grade potential.

Over the past five plus years there have been numerous cultivars released from the UGA, University of Florida, and USDA-ARS peanut breeding programs that have significantly higher levels of resistance to TSWV. We have conducted research trials over the past few years comparing these more recently released cultivars over a wide range of planting dates, starting around April 20th and finishing around June 1st. The results of these trials indicate that the level of TSWV resistance is strong enough in these new cultivars that we can go back to planting more acreage in April. In fact, the past two years of research (2010 and 2011) have shown the highest yield when averaged over the cultivars in the trial was the late April planting (around April 27). Data from the 2011 planting trial is in the table below.

Peanut Yield (lbs/acre) for Seven Planting Dates, Averaged over Four Cultivars UGA, Coastal Plain Experiment Station, Ponder Research Farm, Ty Ty, 2011.

Planting Date	Yield (lbs/acre)
April 19	6482
April 26	6771
May 3	6422
May 10	6526
May 17	6203
May 24	6339
May 31	5861

The primary reason for planting more acreage in April is to take advantage of existing moisture. We've tended to have more dry weather in May and loss of the soil moisture in the top 2-3 inches of the soil surface forces a delay in planting until the soil moisture is replenished. Unfortunately, the past few years it has been well into June before we've gotten sufficient rainfall to continue planting, which pushes physiological maturity well into the cooler part of the fall.

We still must monitor soil temperature when planting in April. Do not plant until the average 4-inch soil temperature is 65 degrees or higher for several consecutive days. Also, do not plant a day or two ahead of an approaching cold front, especially if it is expected to drop minimum temperatures significantly.
Planting earlier will allow fields to receive adequate heat units in order to reach harvest maturity. Consider planting 1/4 to 1/3 of your intended acreage in mid to late April, provided soil temperature is sufficiently warm enough for planting. The remaining acreage should be planted by May 31st.

2012 Peanut Weed Control Update

Eric P. Prostko

Cadre Carryover to Cotton

2011 was one of the worst years for Cadre carryover to cotton. I am certain that the dry weather that was observed in 2010 and 2011 played a significant role. In many areas of the state, rainfall from June 1, 2010 to June 1, 2011 was 9-19" below normal! It is ***impossible*** to accurately predict when Cadre will cause carryover issues to cotton. The only way to avoid this problem is to follow the ***labeled 18 month rotation restriction*** or to not use Cadre. Growers interested in "Cadre-free" peanut weed control programs should consider the following:

PPI/PRE	PRE	Cracking	POST1	POST2*
Sonalan or Prowl	Valor + Strongarm		Cobra or Ultra Blazer + Dual Magnum/ Generic	2,4-DB
Sonalan or Prowl		Gramoxone/Generic + Storm + Dual Magnum/Generic	Cobra or Ultra Blazer + Dual Magnum/ Generic	2,4-DB

*May need 2 applications of 2,4-DB for sicklepod management.

Palmer Amaranth Control

Current recommendations for the control of Palmer amaranth can be found later in this section. If the management of Palmer amaranth continues to be a challenge, consider these common reasons for failure:

1) Peanut field was not "Palmer –free" at planting.
2) Residual herbicides were not used (need at least 2 residuals not counting Prowl or Sonalan).
3) Residual herbicides were not activated with a timely rainfall/irrigation within 7-10 days after application.
4) Postemergence applications were too late (i.e. Palmer was larger than 3").

Classic/Peanut Cultivar Update

Recent research results on the tolerance of new peanut cultivars to postemergence applications of Classic suggest that Georgia-06G and Tifguard are sensitive to this herbicide. When grown under weed-free conditions, application of Classic to these cultivars resulted in yield losses ranging from 7 to 11%. Florida-07 and Georgia Greener have adequate tolerance to Classic.

A New Formulation of Gramoxone (paraquat)

Syngenta will be replacing the older Gramoxone Inteon formulation with the newer ***Gramoxone SL*** formulation. The only difference in these formulations is that the Gramoxone SL formulation does not contain alginate. Alginate is a natural product extracted from seaweed that reduces paraquat adsorption into the blood if ingested. Active ingredient concentrations and use rates for Gramoxone SL will remain the same.

Spartan Charge Added to UGA Recommendations

Spartan Charge 3.5L, from FMC, is a pre-mixture of Spartan (sulfentrazone @ 3.15 lb ai/gal) + Aim (carfentrazone @ 0.35 lb ai/gal). Spartan Charge can be applied preplant or preemergence for annual broadleaf weed control particularly morningglory and Palmer amaranth. Spartan Charge should not be applied to cracking or emerged peanuts. The normal use rate of Spartan Charge on Georgia soils is 3-4 oz/A. ***Spartan Charge should not be used on sands with less than 1% OM***. Labeled rotation restrictions for Spartan Charge include the following: canola = 24 months; field corn = 4 months; cotton = 12 months; small grains = 4 months; sorghum = 10 months; soybean, sunflowers, and tobacco = anytime. ***However, some UGA research suggests that the crop rotation restriction for cotton should be 18 months even at this lower use rate.*** Spartan Charge is a PPO inhibitor which is the same mode of action of other popular herbicides such Cobra, Reflex, Valor, and Ultra Blazer. Any new herbicide should be used on a limited basis until its crop safety and efficacy can be proven on the farm. A complete copy of the Spartan Charge label can be viewed at the following location: http://www.cdms.net/LDat/ld91H013.pdf

Glyphosate and Peanuts

Periodically, peanut fields get accidently treated with glyphosate as a result of spray drift or sprayer contamination. When this occurs, there is some concern over the fate of the peanuts. For more information about the response of peanut to glyphosate, please refer to the following publication which is included in this section: *University of Georgia Cooperative Extension Circular #1007 - Peanut Response to Glyphosate.*

PEANUT WEED CONTROL

Eric P. Prostko, Extension Agronomist – Weed Science

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE		REMARKS AND PRECAUTIONS
	AMOUNT OF FORMULATION/A	LBS. ACTIVE INGREDIENT/A	
EARLY PREPLANT FOLIAR BURNDOWN OF EMERGED ANNUAL WEEDS AND/OR COVER CROPS IN REDUCED TILLAGE SYSTEMS			
glyphosate (various trade names) 3.00 lb ae/gal 3.73 lb ae/gal 4.00 lb ae/gal 4.17 lb ae/gal 4.50 lb ae/gal 5.00 lb ae/gal	 16 - 48 oz 13 - 39 oz 12 - 36 oz 11.7 - 35 oz 11 - 32 oz 10 - 29 oz	0.38 to 1.13 ae	Apply any time prior to planting to control emerged weeds. Refer Apply any time prior to planting to control emerged weeds. Refer to specific label for weeds controlled, application rates, adjuvants, and precautions. Glyphosate does not adequately control cutleaf eveningprimrose or Carolina geranium, and may not provide acceptable control of wild radish. For cover crop control only, use the following rates: wheat < 12", 0.56 lb ae/A; wheat > 12", 0.75 lb ae/A; rye < 18", 0.56 lb ae/A; rye > 18", 0.75 lb ae/A. Glyphosate can also be tank-mixed with **Valor** (1-3 ozs/A), **Aim** (1-2 ozs/A), or ET (0.5-2.0 oz/A) to improve the spectrum of control, particularly for annual morningglories. Refer to specific comments for Valor. **Sequence 5.25EC** (glyphosate + S-metolachlor) is also labeled for preplant use in peanut @ 2.5-3.4 pt/A. Sequence @ 3.4 pt/A is equivalent to 1.28 lb ai/A of S-metolachlor + 0.96 lb ai/A glyphosate. **Applications to wheat and rye should be made before the boot stage or after the wheat is fully headed.** MOA = 9.
glyphosate (various trade names) 3.00 lb ae/gal 3.73 lb ae/gal 4.00 lb ae/gal 4.17 lb ae/gal 4.50 lb ae/gal 5.00 lb ae/gal + 2,4-D amine (various trade names) 3.8 lb/gal	 16 - 48 oz 13 - 39 oz 12 - 36 oz 11.7 - 35 oz 11 - 32 oz 10 - 29 oz + 0.5 to 1.0 pt	0.38 to 1.13 ae 0.24 to 0.48	Refer to comments for glyphosate applied alone. 2,4-D is the most cost-effective option available for burndown of cutleaf eveningprimrose. 2,4-D does not control Carolina geranium. Some 2,4-D products are labeled for application to previous crop stubble or fallow land. In this case, the label directs the user to not plant a crop "until 3 months after application or until the product disappears from the soil". MOA = 9 + 4.
glyphosate (various formulations) 3.00 lb ae/gal 3.73 lb ae/gal 4.00 lb ae/gal 4.14 lb ae.gal 4.50 lb ae/gal 5.00 lb ae/gal + thifensulfuron + tribenuron (FirstShot) 50SG	 16 - 48 oz 13 - 39 oz 12 - 36 oz 12 - 35 oz 11 - 32 oz 10 - 29 oz + 0.5-0.8 oz	0.38 to 1.13 lb ae + 0.008 to 0.013 + 0.008 to 0.013	Refer to comments for glyphosate alone. FirstShot will help improve the control of many broadleaf weeds such as henbit, wild radish, Carolina geranium, and chickweed. Peanut can be planted **30-37 days** after application depending upon soil type (sands or loamy sands = 37 days). Add a NIS @ 0.25% v/v or COC @ 1% v/v if the glyphosate formulation is not "loaded". MOA = 9 + 2 + 2 .
paraquat (Gramoxone Inteon / Gramoxone SL) 2.0 lb/gal (Firestorm/Parazone) 3.0 lb/gal	 2.5 to 3.75 pt 1.7 to 2.5 pt	0.63 to 0.94	Apply anytime prior to planting to control emerged weeds. Add non-ionic surfactant at 1 qt/100 gals or crop oil at 1 gal/100 gals. **Paraquat will not adequately control horseweed, swinecress, purslane speedwell, curly dock, cutleaf eveningprimrose, and larger wild radish.** For cover crop control only, use the following rates: wheat, 0.63 lb ai/A (2.5 pt/A of 2.0 lb/gal or 1.7 pt/A of 3.0 lb/gal); rye, 0.50 lb ai/A (2.0 pt/A of 2.0 lb/gal or 1.3 pt/A oz/A of 3.0 lb/gal). **Cover crops must be mature (seedheads) for adequate control.** Can also be tank-mixed with Valor (1-3 ozs/A) to improve the spectrum of control and provide residual weed control. Refer to specific comments for Valor. MOA = 22.
paraquat (Gramoxone Inteon/ Gramoxone SL) 2SL (Firestorm/Parazone)3SL + thifensulfuron + tribenuron (FirstShot) 50SG	 2.5 to 3.75 pt or 1.7 to 2.5 pt + 0.5-0.8 oz	0.64 to 0.94 + 0.008 to 0.013 + 0.008 to 0.013	Refer to comments for paraquat alone. FirstShot will help improve the control of many broadleaf weeds such as henbit, wild radish, Carolina geranium, and chickweed. Peanut can be planted **30-37 days** after application depending upon soil type (sands or loamy sands = 37 days). Add a NIS @ 0.25% v/v or COC @ 1% v/v. MOA = 22 + 2 + 2 .

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE: AMOUNT OF FORMULATION/A	BROADCAST RATE/ACRE: LBS. ACTIVE INGREDIENT/A	REMARKS AND PRECAUTIONS
paraquat (Gramoxone Inteon / Gramoxone SL) 2.0 lb/gal	2.5 to 3.75 pt	0.63 to 0.94	Refer to comments for paraquat applied alone. 2,4-D is the most cost-effective option available for burndown of cutleaf eveningprimrose. 2,4-D does not control Carolina geranium. Some 2,4-D products are labeled for application to previous crop stubble or fallow land. In this case, the label directs the user to not plant a crop "until 3 months after application or until the product disappears from the soil". MOA = 22 + 4.
(Firestorm/Parazone) 3.0 lb/gal + 2,4-D amine (various trade names) 3.8 lb/gal	1.7 to 2.5 pt 0.5 to 1.0 pt	 0.24 to 0.48	
PREPLANT SOIL INCORPORATED			
ethalfluralin (Sonalan) HFP 3.0 lb/gal	2 pt	0.75	Controls annual grasses and small-seeded broadleaf weeds. Soil incorporate 2 to 3 inches deep within 2 days of application. Incorporation with implements other than power tiller requires two passes, preferably at cross angles. May be tank-mixed with Frontier/Outlook or Dual for control of mixed infestations of annual grasses and nutsedge. *Sonalan may also be applied as a surface application to freshly prepared seedbeds but must be incorporated by 0.5-1.0" of rainfall or irrigation within 2 days after application*. MOA = 3.
pendimethalin (Prowl/ Pendimax) 3.3 lb/gal (Prowl H_20) 3.8 ACS	1.8 to 2.4 pt 2.0 pt	0.75 to 1.0 0.95	Controls annual grasses and small-seeded broadleaf weeds. Soil incorporate 1 to 2 inches deep within 7 days of application. Incorporation with implements other than power tiller requires two passes, preferably at cross angles. Use high rate for Texas panicum or where heavy weed populations are anticipated. May be tank-mixed with Frontier/Outlook, Dual, or Pursuit for control of mixed infestations of annual grasses and nutsedge. Prowl can be applied immediately after planting to a freshly prepared seedbed up to 2 days after planting but before crop emergence. However, adequate incorporation in the form of 0.75" of irrigation or rainfall is needed within 48 hours for optimum activation when applied by this method. **In strip- tillage production systems, the rate of pendimethalin should be increased to 3.0 pts/A (Prowl 3.3EC) or 2.6 pts/A (Prowl H_2O).** MOA = 3.
dimethenamid- P (Outlook/Propel) 6.0 lb/gal	12 to 21 oz	0.56 to 0.98	Controls some annual grasses (not Texas panicum) and small-seeded broadleaf weeds. Suppresses yellow nutsedge but not purple nutsedge. May be tank-mixed with Prowl/ Pendimax or Sonalan for control of mixed infestations of annual grasses and yellow nutsedge. PPI treatments generally provide better control of yellow nutsedge. MOA = 15.
metolachlor (Stalwart, Parallel PCS, Me-Too Lachlor) S-metolachlor (Dual Magnum 7.62EC) (Dual II Magnum 7.64EC) (Cinch 7.64EC)	1.0 to 1.33 pt 1.0 to 1.33 pt	1.0 to1.33 0.95 to 1.27	Controls some annual grasses (not Texas panicum) and small-seeded broadleaf weeds. May provide limited Florida beggarweed suppression. Controls or suppresses yellow nutsedge but not purple nutsedge. Incorporation with implements other than power tiller requires two passes, preferably at cross angles. Deep incorporation may reduce effectiveness. May be tank-mixed with Prowl/Pendimax or Sonalan to control mixed infestations of annual grasses and yellow nutsedge. PPI treatments generally provide better control of nutsedge. Heavy rainfall after planting and/or non-uniform incorporation may result in crop injury expressed as delayed emergence and stunted growth of emerging plants. The generic formulations of metolachlor **(Parallel PCS, Stalwart, Me-Too-Lachlor)** have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials. MOA = 15
diclosulam (Strongarm) 84WG	0.45 oz	0.024	Provides general broadleaf weed control. Incorporate into top 1-3" of final seedbed. Good to excellent control of many species including bristly starbur, wild poinsettia, eclipta, and copperleaf. Should be tank-mixed with a grass herbicide. **Poor control of sicklepod.** Control of nutsedge has been variable and inconsistent. Can also be applied preemergence. **Crop rotation restrictions: cotton = 10 months; soybeans = 0 months; wheat, barley = 4 months; oats, rye = 6 months; corn = 18 months (10 months - IR hybrids); tobacco, sorghum = 18 months; other crops = 30 months.** MOA = 2.
imazethapyr (Pursuit) 2.0 lb/gal 70 DG	 4 oz 1.44 oz	0.063	Controls purple and yellow nutsedge, wild poinsettia, wild radish, pigweed, burgherkin, and several other annual species. Does not control Florida beggarweed or sicklepod. Shallow incorporation is preferred. May be tank- mixed with Dual, Prowl/Pendimax, or Sonalan. Incorporated treatments are more persistent than preemergence or postemergence applications and are more likely to result in carryover. **Rotation intervals for various crops include the following: lima beans, southern peas, soybeans, peanuts, CLEARFIELD corn hybrids - 0 months; wheat, rye - 4 months; field corn - 8.5 months; barley, tobacco - 9 months; bahiagrass, cabbage, canteloupe, cotton, cucumber, Irish potato, lettuce, oats, onion, sorghum, sunflower, sweet corn, sweet potato transplants, sweet pepper transplants, tomato transplants; and watermelon - 18 months; canola - 40 months.** MOA = 2.

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE: AMOUNT OF FORMULATION/A	BROADCAST RATE/ACRE: LBS. ACTIVE INGREDIENT/A	REMARKS AND PRECAUTIONS
CHEMIGATION			
metolachlor - (Stalwart, Parallel PCS, Me-Too-Lachlor), S-metolachlor - (Dual Magnum 7.62E), (Cinch 7.64EC) pendimethalin - (Prowl/Pendimax) 3.3EC (Prowl H_20 3.8ACS)		May be applied by injection through center pivot irrigation systems. Use at normal recommended rates. Apply after planting but before crop emergence. Requires proper system calibration and safety devices (check valves, cutoff switches, etc.) to provide effective weed control and prevent environmental contamination. Accurate herbicide application through chemigation may provide superior weed control compared to conventional ground applications. The generic formulations of metolachlor (Parallel PCS, Stalwart, Me-Too-Lachlor) have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials.	
PREEMERGENCE			
imazethapyr (Pursuit) 2.0 lb/gal 70 DG	 4 fluid oz 1.44 oz	0.063	See comments for Pursuit PPI. Controls the same weeds as listed for Pursuit PPI but with greater dependency on rainfall or irrigation for activation. MOA = 2.
metolachlor (Stalwart, Parallel PCS, Me-Too-Lachlor) S-metolachlor (Dual Magnum 7.62EC) (Dual II Magnum 7.64EC) (Cinch 7.64EC)	1.0 to 1.33 pt 1.0 to 1.33 pt.	1.0 to 1.33 0.96 to 1.27	Controls some annual grasses (not Texas panicum) and small-seeded broadleaf weeds. Provides some suppression of sicklepod and Florida beggarweed. Apply after planting and before crop and weeds emerge. If Dual is used as a PPI treatment, any additional application of Dual should be delayed until peanuts begin emerging (AC). Multiple applications--preplant incorporated followed by at-cracking treatments--improve control of sicklepod, Florida beggarweed, and yellow nutsedge. Preemergence treatments generally provide better broadleaf weed control/suppression. Up to 2 pts/A of any metolachlor formulation can be applied preemergence for the partial control of Florida beggarweed in the southeast Do not apply more than 2.66 pts/A/year of Stalwart/Parallel/Me-Too-Lachlor or 2.8 pts/A/year of Dual Magnum/Dual II Magnum/Cinch formulation. The generic formulations of metolachlor **(Parallel, Stalwart, Me-Too-Lachlor)** have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials. MOA = 15.
dimethenamid-P (Outlook/Propel) 6.0 lb/gal	12 to 21 oz	0.56 to 0.98	Controls some annual grasses (not Texas panicum) and small-seeded broadleaf weeds. Provides some suppression of sicklepod, Florida beggarweed. Apply after planting and before crop and weeds emerge. May be used in a split application method. Preemergence treatments generally provide better broadleaf weed control/suppression. Do not exceed 21 oz/A/year of Outlook/Propel 6E. MOA = 15.
diclosulam (Strongarm) 84WG	0.45 oz	0.024	Refer to PPI section. MOA = 2.
flumioxazin (Valor) 51WP	3.0 oz	0.096	Apply immediately after planting but no later than 2 days after planting. Plant peanuts at least 1.5" deep. **DO NOT** irrigate when peanuts are cracking. Rainfall or irrigation at cracking will cause temporary crop injury that should not result in reduced yields if applied according to the label. Valor will provide good to excellent control of many broadleaf weeds including Florida beggarweed, Palmer amaranth, and tropic croton. **Valor will not control annual/perennial grasses, sicklepod, nutsedge, and cocklebur.** Valor can be tank-mixed with Prowl, Sonalan, Dual Magnum, or Outlook. **Can also be used in strip-tillage peanut production systems in combination with glyphosate or paraquat to improve burndown control.** Rotation restrictions include the following: cotton - 2 months; field corn - 1 month; soybeans - 0 months; tobacco - 2 months; wheat - 2 months. Refer to current product label for additional rotational restrictions. **Completely clean spray equipment THE SAME DAY OF USE as directed on the herbicide label!!!!** MOA = 14.
sulfentrazone + carfentrazone (Spartan Charge) 3.5L	3.0 – 4.0 oz	0.074-0.098 + 0.008-0.011	Will provide good to excellent residual control of pigweed. Can be tank-mixed with Prowl or Dual. Can be tank-mixed with glyphosate or paraquat pre-plant burndowns in strip-tillage systems. Can be applied up to 3 days after planting. **However, do not apply after peanut emergence, at cracking, or if seedling is close to the soil surface. Do not use on soils classified as sand, which have less than 1% OM.** Do not irrigate when peanuts are cracking. Rotation Restrictions: canola = 24 months; field corn = 4 months; cotton = 12 months*; small grains = 4 months; sorghum = 10 months; soybeans = anytime; sunflowers = anytime; tobacco = anytime. ***Some UGA research suggests that the cotton rotation restriction should be 18 months.*** MOA = 14 + 4.

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE: AMOUNT OF FORMULATION/A	BROADCAST RATE/ACRE: LBS. ACTIVE INGREDIENT/A	REMARKS AND PRECAUTIONS
AT CRACKING OR EARLY POSTEMERGENCE			
imazethapyr (Pursuit) 2.0 lb/gal 70 DG	 4.0 oz 1.44 oz	 0.063	See comments for Pursuit PPI and PRE. Provides effective control of nutsedge, wild poinsettia, wild radish, bristly starbur, prickly sida, and several other annual species. Weed size is especially critical for effective control of nutsedge, bristly starbur, and prickly sida. If weeds are emerged, surfactant or crop oil concentrate should be included. May be tank-mixed with paraquat or 2,4-DB for broader spectrum control of emerged weeds. MOA = 2.
metolachlor (Stalwart, Parallel PCS, Me-Too-Lachlor) 8.0 lb/gal S-metolachlor (Dual Magnum) 7.62 lb/gal	1.0 to 1.33 pt 1.0 to 1.33 pt	1.0 to 1.33 0.95 to 1.27	See comments for Dual PPI and PRE. Compared to PPI and PRE treatments, AC applications provide better control of non-emerged broadleaf weeds such as Florida beggarweed and sicklepod. May be tank-mixed with paraquat treatments for improved contact activity and for suppression/control of problem broadleaf weeds and yellow nutsedge. May also be tank-mixed with Basagran, Basagran + 2,4-DB, or Storm. **Do not use Dual II Magnum/Cinch formulations after peanut emergence.** Do apply more than 2.66 pts/A/year of Stalwart/Parallel/Me-Too-Lachlor or 2.8 pts/A/year of Dual Magnum. Research has shown that Dual will provide good to excellent residual control of tropical spiderwort if applied before weed emergence. Do not apply within 90 days of harvest. The generic formulations of metolachlor **(Parallel PCS, Stalwart, Me-Too-Lachlor)** have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials. MOA = 15.
paraquat (Firestorm/Parazone) 3.0 lb/gal (Gramoxone Inteon / Gramoxone SL) 2.0 lb/gal	 5.4 fluid oz 8.0 fluid oz	0.125	Provides effective contact control of sicklepod, Florida beggarweed, Texas panicum, and many other problem weeds. When used alone, paraquat is not effective on smallflower morningglory, prickly sida, wild radish, or tropic croton. Apply anytime **up to 14 days after ground crack**. After 14 days after ground crack, apply in combination with Basagran or Storm. Include NIS at 1 qt/100 gal spray solution with all paraquat treatments. Do not make more than 2 applications per season. Do not apply a total of more than 10.8 ozs/A/year (Gramoxone Max) or 16.0 ozs/A/year (Gramoxone Inteon). Peanut foliage injury is usually temporary. Conditions of high humidity, wet foliage, and/or wet soils result in greater foliage burn. Thrips injury retards crop recovery. Research indicates no adverse effects of adding chlorothalonil products with paraquat tank-mixtures where fungicide treatments are needed. **The success of "at-crack" sprays can be greatly improved by 1) applying herbicides in a minimum of 15 GPA; 2) using flat fan nozzles; 3) decreasing ground speed; and 4) using lower spray pressures (30 PSI). Rain-free period for paraquat is 30 minutes.** MOA = 22.
paraquat (Firestorm/Parazone) 3.0 lb/gal (Gramoxone Inteon / Gramoxone SL) 2.0 lb/gal + bentazon+acifluorfen (Storm) 4.0 lb/gal	0.188 8.0 fluid oz 12.0 fluid oz + 1-1.5 pt	 + 0.5 + 0.25	Provides effective, broad-spectrum weed control. Provides some suppression of yellow nutsedge. Addition of Dual or Frontier/Outlook improves contact activity and provides residual weed suppression/control, but could result in increased foliar peanut burn. Apply anytime up to 28 days after ground crack. Include NIS at 1 qt/100 gal spray solution with all paraquat treatments. **The success of "at-crack" sprays can be greatly improved by 1) applying herbicides in a minimum of 15 GPA; 2) using flat fan nozzles; 3) decreasing ground speed; and 4) using lower spray pressures (30 PSI).** Research indicates no adverse effects of adding chlorothalonil products with paraquat tank-mixtures where fungicide treatments are needed MOA = 22 + 6 +14. * Dual Magnum or generic metolachlors can be used in combination with this treatment to provide residual control of pigweed and tropical spiderwort. NIS is **not** recommended if Dual Magnum or generic metolachlors are used with paraquat + Storm.

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE		REMARKS AND PRECAUTIONS
	AMOUNT OF FORMULATION/A	LBS. ACTIVE INGREDIENT/A	
AT CRACKING OR EARLY POSTEMERGENCE (cont.)			
paraquat (Firestorm/Parazone) 3.0 lb/gal (Gramoxone Inteon / Gramoxone SL) 2.0 lb/gal + bentazon (Basagran) 4.0 lb/gal	8.0 fluid oz 12.0 fluid oz + 0.5 to 1.0 pt	0.189 + 0.25 + 0.5	Provides effective, broad-spectrum weed control. Provides some suppression of yellow nutsedge. Generally reduces peanut injury compared to other paraquat treatments. The lower rate of Basagran (0.5 pt) is usually sufficient to reduce peanut foliar burn and provide control of smallflower morningglory. The higher rate (1 pt) is necessary for control of weeds such as bristly starbur and prickly sida. Apply anytime up to 28 days after ground crack. Include NIS at 1 qt/100 gal spray solution with all paraquat treatments. **The success of "at-crack" sprays can be greatly improved by 1) applying herbicides in a minimum of 15 GPA; 2) using flat fan nozzles; 3) decreasing ground speed; and 4) using lower spray pressures (30 PSI).** Research indicates no adverse effects of adding chlorothalonil products with paraquat tank-mixtures where fungicide treatments are needed. MOA = 22 + 6. * Dual Magnum or generic metolachlors can be used in combination with this treatment to provide residual control of pigweed and tropical spiderwort. NIS is **not** recommended if Dual Magnum or generic metolachlors are used with paraquat + Basagran.
diclosulam (Strongarm) 84WG	0.45 ozs	0.024	24(c) label for use in Georgia. **Only weed on current 24(c) label is tropical spiderwort.** Can be applied up until 30 days after planting. Use in combination with a NIS @ 0.25% v/v (1 qt/100 gals). **When applied postemergence in peanut, cotton rotation restriction is 18 months.** Follow other rotation restrictions listed in PPI section. Label must be in the possession of user at the time of application. MOA = 2.
POSTEMERGENCE			
acifluorfen (Ultra Blazer) 2L 2.0 lb/gal	0.5 to 1.5 pt	0.125 to 0.38	Especially useful for control of morningglories, tropic croton, wild radish, wild poinsettia, hophornbeam copperleaf, and spider flower. Adjust rate according to weed size and species as noted on the label. Use 1.0 pt/A or less for control of highly sensitive species such as hemp sesbania and showy crotalaria. Slight to moderate peanut foliage burn may result. Observations over the past several years indicate that newer amine formulation may be less injurious than older sodium salt formulation. Do not apply within 75 days of harvest or more than 2 pt/A per season as a postemergence treatment. Apply with nonionic surfactant at 1 qtt/100 gal spray solution (0.25% v/v). May be tank-mixed with 2,4-DB (1 pt/A). The Blazer + 2,4-DB tank mixture is generally more injurious to peanuts than either product alone. May be tank-mixed with Basagran for control of broadleaf weeds such as morningglories, cocklebur, and prickly sida. A pre-packaged mix of acifluorfen + bentazon is marketed as Storm. **Rain-free period for Ultra Blazer is 4 hours.** MOA = 14.
bentazon (Basagran) 4.0 lb/gal	1.5 to 2.0 pt	0.75 to 1.0	Apply for postemergence control of yellow nutsedge, cocklebur, bristly starbur, smallflower morningglory, prickly sida, and certain other weeds. Treat when broadleaf weeds are small and actively growing. Adjust rate according to weed size as noted on label. Two applications may be required for control of yellow nutsedge. For yellow nutsedge, include crop oil concentrate at 1 qt/A. Do not foliarly apply sulfur 14 days before or after use of crop oil concentrate to minimize risk of peanut foliage burn. May be tank-mixed with 2,4-DB amine 2L (0.5 pt/A) for improved control of morningglories. Early-season applications of bentazon at high rates following in-furrow applications of Di-Syston may infrequently result in SEVERE peanut injury**. Rain-free period for Basagran is 4 hours.** MOA = 6.
bentazon + acifluorfen (Storm) 4 lb/gal	1.5 pt	0.5 + 0.25	Controls morningglories, cocklebur, prickly sida, ragweed, eclipta, tropic croton, and several other broadleaf weeds with less injury than Blazer alone. Application timing is critical--weeds must be small. Include surfactant or crop oil concentrate. Can be mixed with 2,4-DB for control of larger weeds and for control of sicklepod. Do not apply within 75 days of harvest. May be tank-mixed with paraquat. **Rain-free period for Storm is 4 hours.** MOA = 6 + 14.

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE		REMARKS AND PRECAUTIONS
	AMOUNT OF FORMULATION/A	LBS. ACTIVE INGREDIENT/A	
POSTEMERGENCE (cont.)			
2,4-DB (Butyrac 175) 1.75 lb/gal (Butyrac 200) 2.0 lb/gal (Butoxone 175) 1.75 lb/gal (Butoxone 200) 2.0 lb/gal	 14 to 18 oz 13 to 16 ozs 16 to 28 ozs 14 to 26 ozs	 0.19 to 0.25 0.20 to 0.25 0.22 to 0.38 0.22 to 0.40	Apply up to 2 applications per season as an over-the-top treatment for broadleaf weed control. Use rates and application timing varies by specific product label. For control of morningglory and citronmelon, apply in the seedling stage. Cocklebur one foot or more in height can be controlled; however, earlier treatment is preferred. Also effective for control of escaped sicklepod. Do not apply if peanuts are under drought stress. Butyrac may be applied up to 12 weeks after planting. Do not apply Butoxone within 30 days of harvest. Research indicates no adverse effects of adding chlorothalonil products with 2,4-DB where fungicide treatments are needed. **Rain-free period for 2,4-DB is 1 hour. Do n ot tank-mix with postemergence grass herbicides.** MOA = 4.
imazethapyr (Pursuit) 2.0 lb/gal 70 DG	4 fluid oz 1.44 oz	0.063	See comments for Pursuit PPI, PRE, and AC/EP. Generally should be used early postemergence-when weeds are extremely small. Controls wild radish, pigweeds, morninglories, cocklebur, and several other annual species. Compared to PPI, PRE. and AC/EP treatments, POST applications are less effective on nutsedge, wild poinsettia, and some other species. Applications should be made before nutsedge exceeds 3 to 4 inches and bristly starbur exceeds 2 inches. May be tank-mixed with paraquat or 2,4-DB. Post control of escaped wild poinsettia is greatly enhanced in combination with paraquat. **Rain-free period for Pursuit is 1 hour.** Do not apply within 85 days of harvest. MOA = 2.
imazapic (Cadre)70DG (Cadre/Impose) 2AS	1.44 oz 4.0 oz	0.063	Provides excellent control of many broadleaf and grass weeds and both purple and yellow nutsedge. Apply as an early postemergence treatment when weeds are less than 2-3 inches in height. Under conditions of heavy weed pressure, applications of Cadre 10-14 days following an at-cracking treatment (paraquat combination) has resulted in superior weed control. Do not apply within 90 days of harvest. Use with NIS (0.25% v/v) or COC (1 qt/A). Do not tank-mix with postemergence grass herbicides. **Rotation restrictions include: wheat, rye - 4 months; corn, snapbeans, southern peas, soybeans, tobacco - 9 months; cotton, oats, sweet corn, grain sorghum - 18 months; canola - 40 months. See label for additional restrictions. Rain-free period for Cadre is 3 hours.** MOA = 2.
lactofen (Cobra 2EC)	12.5 oz	0.195	Apply after peanuts reach 6 true leaf stage of growth. Use a crop oil concentrate at 1% v/v (1 gal/100 gals). Provides good control of pigweeds, morninglories, ragweed, copperleaf, wild poinsettia, and eclipta. Cobra can be tank-mixed with Basagran, Cadre, Pursuit, Select, and 2,4-DB. Pre-harvest interval is 45 days. **Rain-free period is 30 minutes.** MOA = 14.
sethoxydim (Poast) 1.5 lb/gal (Poast Plus) 1.0 lb/gal	 1.0 to 1.5 pt 1.5 to 2.25 pt	0.19 to 0.28	For control of annual and perennial grasses. Apply when annual grasses are small (1-6 inches) and actively growing. Under favorable conditions, large Texas panicum can be controlled. For perennial grass control, two applications are usually required for satisfactory control. Always apply with 1 qt/A crop oil concentrate. Tank-mixtures with other herbicides, such as 2,4-DB, may reduce grass control. Do not apply sulfur 14 days before or after application to minimize risk of peanut foliage burn. Reduced spray volumes (10 GPA) may improve grass control. Do not apply within 40 days of harvest. Refer to Table 1 at the end of this chapter for more specific information about grass control. **Rain-free period for Poast is 1 hour.** MOA = 1.

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE		REMARKS AND PRECAUTIONS
	AMOUNT OF FORMULATION/A	LBS. ACTIVE INGREDIENT/A	
POSTEMERGENCE (cont.)			
clethodim (Select, Arrow, others) 2EC (Select Max / TapOut) 0.97EC	6 to 8 oz 12 to 16 oz	0.09 to 0.125	For control of annual and perennial grasses. Apply when grasses are small (<6 inches) and actively growing. Under favorable conditions, large Texas panicum and bermudagrass can be effectively controlled. Heavy bermudagrass pressure or larger Texas panicum will require a follow-up treatment. When tank-mixing with a broadleaf herbicide or controlling perennial grasses, increase rates (8-16 ozs/A-Select; 16-32 oz/A-Select Max / TapOut). Do not apply more than 32 oz/A/ year (Select) or 64 oz/A/year (Select Max / TapOut). Always apply with a crop oil concentrate at 1% v/v (Select/Arrow). A NIS (0.25% v/v) can be used with Select Max to reduce crop injury potential. May be tank-mixed with Basagran, Blazer, Storm, Orthene, Danitol, or Folicur. **Do not tank-mix with chloro-thalonil products or reduced grass control can occur.** Do not apply within 40 days of harvest. Refer to Table 1 at the end of this chapter for more specific information about grass control. **Rain-free period is 1 hour.** MOA = 1.
fluazifop-P (Fusilade DX) 2 lb/gal	8 - 24 oz	0.125 - 0.375	For the control of annual and perennial grass weeds. Use rate depends upon weed and weed size. Refer to table at the end of this section for specific information about rates and timings. Do not apply more than 48 oz/A/season. Do not apply more than 24 oz/A/application. Maintain a minimum of 14 days between application. Use a NIS @ 0.25% v/v or COC @ 1% v/v. PHI = 40 days. Refer to Table 1 at the end of this chapter for more specific information about grass control. **Rain-free period = 1 hour.** MOA = 1. Fusilade also has some activity on bristly starbur (i.e. goathead or Texas sandspur).
chlorimuron (Classic) 25DF	0.5 oz	0.008	Make one application per season as an over-the-top treatment for mid-season Florida beggarweed and bristly starbur control or suppression. Under favorable conditions--good soil moisture, moderate temperatures, and high relative humidity--other species such as cocklebur, ragweed, and sicklepod may be suppressed. Avoid applications during periods of drought/heat stress because of potential for poor weed control and crop injury. **Applications of Classic may not provide acceptable control of Florida Beggarweed that has escaped control or is regrowing after an previous application of Cadre.** Include nonionic surfactant at 1 qt/100 gals spray solution with all Classic applications. Addition of ammonium sulfate (2 lb/A) or feed grade urea (2 gal/A) improves activity on bristly starbur. Classic can be applied from 60 days after peanut emergence to within 45 days of harvest. APPLICATIONS OF CLASSIC APPLIED FROM 60 DAYS AFTER CROP EMERGENCE TO 45 DAYS BEFORE HARVEST MAY CAUSE A SLIGHT INCREASE IN TSWV SYMPTOMS. Temporary yellowing of peanut foliage and reduction of canopy growth sometimes occur. Can be tank-mixed with Bravo or 2,4-DB. However, combinations of Classic + 2,4-DB result in significantly more foliar crop injury compared to Classic alone. Do not use on Spanish peanut. Do not use the combination of Classic + 2,4-DB on Southern Runner. Do not tank-mix with elemental sulfur. Rain-free period for Classic is 1 hour. **Do not use on Georgia-06G or Tifguard.** MOA = 2
NON-SELECTIVE APPLICATOR (NSA)			
paraquat (Gramoxone Inteon / Gramoxone SL) 2SL	50:50 solution in water		For the salvage control/suppression of Palmer amaranth and Florida beggarweed. To prevent seed production in Palmer amaranth, apply within 2 weeks of pollen shed. Tractors should be operated at speeds of 5 MPH or less. NSA's that have performed well (>85% control) in UGA tests include the following: GrassWorks Weed Wiper, Smucker's Top Crop Super Sponge, LMC-Cross Wick-Bar. Do not apply within 30 days of digging. Do not apply more than 1 pt/A of Gramoxone Inteon. In order for NSA's to be effective, at least 60% of the weed must be wicked/wiped. Additionally, this treatment may also be more effective on pigweed plants that are just starting to produce seedheads. Rain-free = 30 minutes. MOA = 22.
HARVEST AID			
carfentrazone (Aim) 2EC	1 - 2 oz	0.156 - 0.031	Useful for the late-season dessication/defoliation of annual morninglories (*Ipomoea* sp.). Aim is less effective on smallflower morningglory. Apply 7 days before harvest. Use in combination with either a NIS (0.25% v/v) or COC (1% v/v). Aim may cause peanut leaf spotting or burning. Use at least 15 GPA for optimum results. Do not graze or feed peanut hay to livestock. Only 1 application per season is permitted. Rain-free period = 6-8 hours. MOA = 14.

WEED RESPONSE TO BURNDOWN HERBICIDES USED IN PEANUT

Eric P. Prostko, A. Stanley Culpepper, and Steve M. Brown

Weed Species	Burndown Treatment[1]							
	2,4-D [3]	glyphosate acid[2]	glyphosate acid [2] + 2,4-D [3]	glyphosate acid [2] + Valor	glyphosate acid[2] + Aim or ET	paraquat	paraquat + 2,4-D	paraquat + Valor[4]
GRASSES / SEDGES								
annual bluegrass	N	E	E	E	E	G-E	G-E	
bermudagrass	N	F	F	F	F	P	P	
crabgrass	N	E	G-E	E	E	G		
goosegrass	N	E	G-E	E	E	F-G		
Italian ryegrass	N	G-E	G	G	G	P-F	P-F	
johnsongrass	N	G-E	G	G-E	G-E	P		
little barley	N	E	E	E	E	G	G	
sandbur	N	E	G-E	E	E	G		
Texas panicum	N	E	G-E	E	E	G		
volunteer corn	N	E	E	E	E	F-G		
purple nutsedge	N	F-G	F-G	G	F-G	P-F		
yellow nutsedge	N	F	F	F	F	P-F		
BROADLEAVES								
bristly starbur	G	G-E	G-E	E	E	E		
buttercup	G	G-E	E	G-E	G-E	E		
Carolina geranium	F	P-F	G	G	F-G	G-E	G-E	
chickweed	P	E	E	E	E	E	E	
citronmelon	F	G-E	E	E	E	F		
cocklebur	E	E	E	E	E	G-E		
coffee senna	G	E	E	E	E	F		
corn spurry	P-F	G-E	G-E			F-G		
cowpea	G	E			E	E		
cudweed	P-F	G-E	G-E	E		F-G		
curly dock	P-F	F	F-G	F	F	P	P-F	
eveningprimrose	E	P-F	E	F-G	F	P-F	E	F-G
eclipta	P	F			G-E	F		G
Florida beggarweed	P-F	E	E	E	E	E		
Florida pusley	F	F	G	F-G	G	F		G
field pansy	P-F	F-G	F-G	G		G-E		
hemp sesbania	G-E	P-F	E		G-E	F		
henbit	P-F	F	G-E	E	E	G	G-E	
horsenettle	F	F			P-F	P-F		
Horseweed	F-G	F-G	G-E	F-G	G	F	G	F
ALS-resistant	F-G	F-G	G-E	F-G	G	F	G	F
Glyphosate-resistant	F-G	P	F-G	P	F	F	G	F

WEED RESPONSE TO BURNDOWN HERBICIDES USED IN PEANUT (continued)

Weed Species	Burndown Treatment[1]							
	2,4-D [3]	glyphosate acid[2]	glyphosate acid [2] + 2,4-D[3]	glyphosate acid [2] + Valor	Glyphosate[2] + Aim or ET	paraquat	paraquat + 2,4-D	paraquat + Valor[4]
lambsquarters	E	G	G		G-E	F-G		
morningglory, Ipomoea	G	F	E	E	E	F-G		
morningglory, smallflower	F	G	E	E	G-E	P		
Pennsylvania smartweed	F	G	G		G-E	P		
Pigweed	G-E	G-E	E	E	E	G	G-E	G-E
ALS-resistant	G-E	G-E	G-E	E	E	G	G-E	G-E
Glyphosate-resistant	G-E	P	F-G	P	F	G	G-E	G-E
prickly sida	F-G	F-G	G		F-G	P-F		
purslane	G-E	F-G	G-E	G	F-G	G		
ragweed	E	G	E		G-E	G		
redweed	F	G			G-E	F		
shepherdspurse	G	G			G	G	G-E	
sicklepod	F-G	G-E	E	E	G-E	E		
speedwell	P-F	G-E	G-E	E	E	F	G	
spurred anoda	F-G	G			G	F-G		
swinecress	F-G	F-G	G	F-G	F-G	P	P-F	
tropic croton	F	G-E	G-E	E	G-E	F		
tropical spiderwort	G-E	P	G-E	F	Aim = G-E ET = P-F	G	G-E	
velvetleaf	F-G	G			E	P		
vines (maypop, trumpet creeper, bigroot mg)	F	P-F			P-F	P		
Virginia pepperweed	G-E	G			G	P-F	G-E	
volunteer peanuts	P	F	F	F-G	F	P	P	F-G
wild lettuce	G	G	G-E	E	G-E	P		
wild poinsettia	F-G	G			G-E	G-E		
wild radish	G	F-G	E	G	G	F	F-G	G
COVER CROPS								
clover	F	F	F-G		F	F-G		
lupine	G	G	G		G	F-G		
small grains	N	E	G-E	E	E	G		G
vetch	G	F	G-E	F	F	F		

Key: E = 90% or better control; G = 80% to 90% control; F = 60% to 80% control; P = 30% to 60% control; N = < 30% control.

[1] Application rates per acre: 2,4-D, 1 pt; glyphosate acid, 0.75 lb a.e.; paraquat , 0.63 lb a.i.; Valor, 1 to 2.0 oz (Note: if 3 ozs/A of Valor is used, burndown control may be better than indicated and residual control will be increased); Aim , 1-2 oz/A; ET, 0.5-2.0 oz/A.

[2] Mixing herbicides with glyphosate occasionally reduces grass control (including cover crops). This is more likely to occur with large weeds in dry conditions.

[3] Labels for 2,4-D are ambiguous concerning the waiting period between application and planting.

[4] Use a NIS (0.25% v/v) or COC (1% v/v) with this tank-mixture. A COC may be preferred if weeds are large

WEED RESPONSE TO HERBICIDES USED IN PEANUTS

Eric P. Prostko, Extension Agronomist - Weed Science

	I PPI/PRE[1,2]						PRE			POSTEMERGENCE	
	Prowl Pendimax Sonalan	**Dual Magnum[3]**	**Lasso Intrro**	**Frontier Outlook**	**Pursuit**	**Strongarm**	**Solicam**	**Spartan Charge**	**Valor**	**Paraquat[4]**	**Paraquat + Storm**
Perennials bermudagrass	P	P	P	P	P	P	P		P	P	P
johnsongrass-rhizome	P	P	P	P	P	P	P		P	P	P
nutsedge, purple	P	P	P	P	G	P-F	P-F		P	P-F	F
nutsedge, yellow	P	F-G	F	F	F-G	P-F	P-F		P	P-F	F-G
Grasses (annual) broadleaf signalgrass	G-E	F-G	P	F	P	P	G		P	G	G
crabgrass	E	E	E	E	F	P	G-E		P	F-G	F-G
crowfootgrass	E	E	E	E	P	P	G		P	G	G
fall panicum	G	G	G	G	P-F	P	G		P	G	G
goosegrass	E	E	E	E	F	P	G		P	F-G	F-G
johnsongrass-seedling	E	F	F	F	G	P			P	G	G
sandbur	E	F-G	F-G	F-G		P			P	F	F-G
Texas panicum	G-E	P	P	P	P-F	P-F	P		P	G-E	G-E
Broadleaves bristly starbur	P	P	F	P	F	E	P-F		F	P-F	F-G
burgherkin	P	P	P	P	E	G	G		G	F	G
carpetweed	G	P-F	P-F	G	F-G	G	G			F-G	G
citronmelon	P	P	P	P	P	G			G	F	G
cocklebur	P	P	P	P	G-E	G-E	P-F		P	G	G-E
coffee senna	P	P	P	P	F-G	P	F		P-F	F	E
copperleaf	P	P		F-G	P	G-E			G-E	P	G
cowpea	P	P	P	P	P	P	P		P-F	F-G	F
crotalaria	P	P	P	P					G		F-G
croton, tropic	P	P	P-F	P	P	F-G	G		G	P	G
dayflower, Benghal tropical spiderwort	P	G-E	F	F	G	G	P-F		F	G	G
eclipta	P	P-F	P-F	P-F	P	G-E	P		G-E	P-F	F-G
Florida beggarweed	P	P-F	F	P-F	P	F-G	G		G-E	G-E	G-E
Florida pusley	E	G-E	G-E	G-E	G	G-E	G-E		G-E	P	P
groundcherry, cutleaf	P	G	G	G							
jimsonweed	P				G	G-E	F-G		G	P	F

WEED RESPONSE TO HERBICIDES USED IN PEANUTS (continued)

	I PPI/PRE[1,2]						PRE			POSTEMERGENCE	
	Prowl Pendimax Sonalan	**Dual Magnum[3]**	**Lasso Intrro**	**Frontier Outlook**	**Pursuit**	**Strongarm**	**Solicam**	**Spartan Charge**	**Valor**	**Paraquat[4]**	**Paraquat + Storm**
hairy indigo	P	F				G	G		G	F	
hemp sesbania	P	P	P	P	P	P-F	P		G		G
horseweed									G-E	P	P
lambsquarters	E	F	F	G	F	G-E	F-G		G-E	F	F-G
morningglory spp.	P	P	P	P	G	F-G	P-F		F-G	P	F
cypressvine	P	P	P	P	G		F		G	F-G	F-G
entireleaf/ ivyleaf	P	P	P	P	G	F-G	P		F-G	F	G
pitted	P	P	P	P	G	F-G	P		F	F	G
purple moonflower	P	P	P	P			P			F	G
red	P	P	P	P	G	F			G	F	G
smallflower	P	P	P	P	E	G	P-F		G-E	P	G-E
tall	P	P	P	P	G				F-G	F	G
Pigweeds	G	G	G	G	E	G	G	G-E	E	F	G-E
ALS-resistant	G	G	G	G	P	P	G	G-E	E	F	G-E
poorjoe											
prickly sida	P	F	F	F	G-E	F-G	G-E		G-E	F	G
primrose, cutleaf evening										P	G (+2,4DB)
purslane	G-E	G	G	G	G		F		G-E	G	G
ragweed	P	P	P	F-G	P	G-E	G		G-E	P-F	G
redweed	P					G	G-E		G-E	F	G
spurred anoda	P	P	P	P		F-G			F	P	G
sicklepod	P	P	F	P	P	P	F		P	G-E	G-E
smartweed	P				G	G			P-F	G-E	G
spider flower	P	P	P	P	G						
spurge spp.	P	P-F	P	P-F			F-G		G-E		
velvetleaf	P	P	P	P	P-F	G-E			F	F	F-G
wild poinsettia	P	P	P	P	E	G-E	P		F-G	F	G
wild radish	P	P	P	P	E		F			F	G

Abbreviations: E = Excellent (> 90%); G = Good (80-89%); F = Fair (70-79%); P = Poor (< 70%). (If no letter is given, response is unknown.) PPI=Preplant Incorporated, PRE=Preemergence.

[1] Ratings for Pursuit PPI and PRE are similar. 2Ratings for Dual, Lasso and Frontier PRE and AC are similar. See remarks for additional information.

[3] The generic formulations of metolachlor (Parallel PCS, Stalwart, Me-Too-Lachlor) have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials.

[4] Comercially available as Firestorm or Parazone or Gramoxone Inteon or Gramoxone SL.

WEED RESPONSE TO HERBICIDES USED IN PEANUTS (continued)

	POSTEMERGENCE												
	Strongarm**	**Paraquat + Basagran**	**2,4-DB**	**Pursuit**	**Basagran**	**Ultra Blazer**	**Cobra**	**Storm**	**Cadre**	**Fusilade**	**Select**	**Poast**	**Classic**
Perennials bermudagrass	P	P	P	P	P	P	P	P	P	G	G	F-G	P
Johnsongrass-(rhizome)	P	P	P	P	P	P	P	P	F-G	G-E	G	F-G	P
nutsedge, purple		F	P	G	P	P	P	P	G-E	P	P	P	P
nutsedge, yellow		F-G	P	F-G	G	P	P-F	F	G-E	P	P	P	F-G
Grasses broadleaf signalgrass	P	G	P	P	P	P	P-F	P	G	G	G-E	G-E	P
crabgrass	P	F-G	P	P-F	P	P	P-F	P	G	G	G-E	G-E	P
crowfootgrass	P	G	P	P-F	P	P	P	P	G	F-G	G	F-G	P
fall panicum	P	G	P	P	P	F	P	P	G	G-E	G-E	G-E	P
goosegrass	P	F-G	P	P	P	P	P	P	F	G	G	G	P
johnsongrass-seedling	P	G	P	F	P	P	P	P	F-G	G-E	G-E	G-E	P
sandbur	P	F-G	P		P	P	P-F	P	G	G	G	G	P
Texas panicum	P	G-E	P	P-F	P	P	P	P	F-G	G	G-E	G-E	P
Broadleaves bristly starbur	E	F	P-F	P-F	G	P-F	G	F-G	F	F	P	P	F
burgherkin		F	F	F	P	G	G	F	G-E	P	P	P	P
carpetweed		P	P	F-G	P	G-E	G-E	G	F-G	P	P	P	
citronmelon		F	G	P	P	F	G	F	G	P	P	P	P
cocklebur	E	G	E	E	E	G	G-E	E	E	P	P	P	F
coffee senna		E	F-G	F	G	P	P-F	F	G	P	P	P	P
copperleaf	P	P	P	P	P	G-E	G-E	F	P-F	P	P	P	P
cowpea		P-F	P-F	P	P	P-F	P-F	P-F	P-F	P	P	P	F
crotalaria					P	E	E	G-E		P	P	P	
croton, tropic	P	P	P	P	P	E	E	G-E	P	P	P	P	P
dayflower, Benghal tropical spiderwort	G	G	P	F-G	G	P	P	P	F-G	P	P	P	F
eclipta	G-E	F	P	P	G	F-G	F-G	G	P-F	P	P	P	P
Florida beggarweed	P-F	G-E	P	P	P	P	P-F	P	F-G	P	P	P	F-G
Florida pusley		P	P	P	P	P	F-G	P	P	P	P	P	P
groundcherry, cutleaf		F-G			P	G	G	F-G		P	P	P	
jimsonweed		E	P	F-G	E	E	E	G	E	P	P	P	

WEED RESPONSE TO HERBICIDES USED IN PEANUTS (continued)

	POSTEMERGENCE												
	Strongarm**	**Paraquat + Basagran**	**2,4-DB**	**Pursuit**	**Basagran**	**Ultra Blazer**	**Cobra**	**Storm**	**Cadre**	**Fusilade**	**Select**	**Poast**	**Classic**
hairy indigo			F	P	P	G	G	F	F	P	P	P	F-G
hemp sesbania				P	P	E	E	G-E	P	P	P	P	F-G
horseweed	G	P	P	P	P	P	P	P	P	P	P	P	F
ALS-resistant	P												P
lambsquarters		F	F	P	F	P-F	P-F	F	P-F	P	P	P	P
morningglory spp.	G-E	F-G	F-G	G	F	G-E	G-E	G	G	P	P	P	
cypressvine		G-E	F	G	G	G	G-E	G	G	P	P	P	
entireleaf/ ivyleaf	G-E		G	F-G	P	G	F-G	F	G	P	P	P	
pitted	G-E		F-G	G	P	G-E	G	F-G	G	P	P	P	
purple moonflower	F-G		F-G	P	P	G-E	G-E	G	F	P	P	P	P
red			G		F-G	G-E	G-E	G-E		P	P	P	
smallflower	G-E	G-E	F	E	E	G-E	G-E	G-E	E	P	P	P	
tall			G		P	G	G	F-G	G	P	P	P	
Pigweeds	P	F-G	F	E	P	G-E	G-E	G	E	P	P	P	F
ALS-resistant	P	F-G	F	P	P	G-E	G-E	G	P	P	P	P	P
poorjoe			F			G	G			P			
prickly sida		G	P	P-F	G	P	G	G	G	P	P	P	P
primrose, cutleaf evening	P	F (+2,4-DB)	F	P	P	P	P	P	P	P	P	P	P
purslane		G	G	P-F	G	E	E	G-E	P-F	P	P	P	
ragweed	E	F	F	P	F	E	E	G	F	P	P	P	P-F
redweed		G	P	P	G	P	F	G	G	P	P	P	P
spurred anoda		F-G	P		G	P	P	F	G	P	P	P	
sicklepod	P	G	F-G	P	P	P	P-F	P	G-E	P	P	P	P-F
smartweed		G	P	G-E	G-E	G-E	G-E	G-E	F-G	P	P	P	P
spider flower				F-G		G	G	F	F-G	P	P	P	F
spurge spp.			P	P	P	F	F	F		P	P	P	P
velvetleaf		G	P	P-F	G	P-F	G	F-G		P	P	P	
wild poinsettia	P-F	G-E	P	P-F	P	G-E	G-E	G	E	P	P	P	P
wild radish	G-E	F	P	G-E	P-F	E	E	G	E	P	P	P	P

Abbreviations: E = Excellent (> 90%); G = Good (80-89%); F = Fair (70-79%); P = Poor (<70%). If no symbol is given, response is unknown. [4]Palmer amaranth control may be less than indicated.

**24(c) label for use in Georgia only for tropical spiderwort.

TABLE 1. SUMMARY OF PEANUT GRASS HERBICIDES.

	HERBICIDE				
	Fusilade DX	**Poast**	**Poast Plus**	**Select/Arrow/Others**	**Select Max / TapOut**
Maximum Rate/A/ Season	48 oz	2.5 pt	3.75 pt	32 oz	64 oz
Maximum Rate/A/ Application	24 oz	1.5 pt	1.5 pt	16 oz	32 oz
broadleaf signalgrass	12 oz (2-4")	1.0 pt (up to 8")	1.5 pt (up to 8")	6-8 oz (2-6")	9-16 oz (2-6")
crabgrass	12 oz (1-2")	1.0 pt (up to 6")	1.5 pt (up to 6")	6-8 oz (2-6")	9-16 oz (2-6")
crowfootgrass	NL*	NL	NL	6-8 oz (2-6")	9-16 oz (2-6")
field sandbur	12 oz (2-4")	1.25 pt (up to 3')	1.875 pt (up to 3")	6-8 oz (2-6")	9-16 oz (2-6")
goosegrass	8 oz (2-4")	1.0 pt (up to 6")	1.5 pt (up to 6")	6-8 oz	9-16 oz (2-6")
Texas panicum	12 oz (2-8")	1.0 pt (up to 8")	1.5 pt (up to 8")	6-8 oz (2-6")	9-16 oz (2-6")
rhizome johnsograss	12-24 oz (1st) (8-18") 8-24 oz (2nd) (6-12")	1.5 pt (1st) (up to 25') 1.0 pt (2nd) (up to 12")	2.25 pt (1st) (up to 25") 1.5 pt (2nd) (up to 12")	8-16 oz (1st) (12-24") 6-8 oz (2nd) (6-18")	12-32 oz (1st) (12-24") 9-24 oz (2nd) (6-18")
bermudagrass	12-24 oz (1st) (4-8" runners) 8-24 oz (2nd) (4-8" runners)	1.5 pt (1st) (up to 6" stolon) 1.0 pt (2nd) (up to 4" stolon	2.25 pt (1st) (up to 6" stolon 1.5 pt (2nd) (up to 4" stolon	8-16 oz (1st) (3-6" runners) 8-16 oz (2nd) (3-6" runners	12-32 oz (1st) (3-6" runners) 12-32 oz (2nd) (3-6" runners)

*NL= crowfootgrass was not listed on the product label.

SUGGESTED HERBICIDE PROGRAMS FOR THE CONTROL OF TROPICAL SPIDERWORT (BENGHAL DAYFLOWER) IN PEANUT:

Program 1

a) **PRE Immediately After Planting:** Valor @ 3 oz/A + Dual Magnum or generic metolachlor (Stalwart, Parallel PCS, Me-Too-Lachlor) @ 1 pt/A **and**
b) **POST when spiderwort is 1-2" tall:** Cadre/Impose 2L @ 4 oz/A or Strongarm @ 0.45 oz/A + Dual Magnum or generic metolachlor (Stalwart, Parallel PCS, Me-Too-Lachlor) @ 1 pt/A.

Program 2

a) **AT-CRACK (before 28 days after peanut cracking):** Apply Gramoxone Inteon / Gramoxone SL@ 12 oz/A or Firestorm/Parazone @ 8 oz/A + Basagran @ 8 oz/A + Dual Magnum or generic metolachlor (Stalwart, Parallel PCS, Me-Too-Lachlor) @ 1 pt/A **and**
b) **POST (2-3 weeks after at-crack spray):** Apply Cadre/Impose 2L @ 4 oz/A or Strongarm @ 0.45 oz/A + Dual Magnum or generic metolachlor (Stalwart, Parallel PCS, Me-Too-Lachlor) @ 1 pt/A.

*When using Dual Magnum or generic metolachlor POST in combination with Cadre/Impose, Gramoxone/Firestorm, or Strongarm, additional spray adjuvants (NIS, COC) are not necessary. The maximum amount/A/year of Dual Magnum that can be applied is 2.8 pts. The maximum amount/A/year of Stalwart, Parallel PCS, or Me-To-Lachlor that can be applied is 2.66 pts.

TABLE 2. SUGGESTED HERBICIDE PROGRAMS FOR MANAGING ALS – RESISTANT PALMER AMARANTH IN PEANUT.[1]

Preplant Incorporated	Preemergence[2]	Cracking or early postemergence[3] (Palmer < 2 in.)	Postemergence[4] (Palmer < 3 in.)
Prowl[5] or Sonalan	Valor or Spartan Charge[6,7]		Cobra[7] or Ultra Blazer[7,8,9]+2,4-DB
Prowl[5] or Sonalan		Gramoxone Inteon or Gramoxone SL or Firestorm or Parazone + Storm + Dual Magnum[9]	Cobra[7] or Ultra Blazer[7] + Dual Magnum[9]

[1] ALS-resistant Palmer amaranth is a very serious concern. An aggressive management program is necessary to slow spread of the resistant biotypes and to reduce selection pressure in areas currently not infested with resistant biotypes. A combination of soil residual and postemergence herbicides will be required for optimum control.

[2] Strongarm is not included in this table because it is an ALS-inhibiting herbicide. However, it can be used for the control of other broadleaf weeds. If Strongarm is used preemergence and ALS-resistance is suspected, Cadre or Pursuit should **NOT** be applied postemergence.

[3] Apply cracking or early postemergence treatment only if weeds have emerged.

[4] Cadre or Pursuit may be tank-mixed with Cobra or Ultra Blazer if needed for control of other weed species. Cadre and Pursuit are ALS- inhibitors. Because of concerns with weed resistance to ALS-inhibitors, a mixture of Cobra or Ultra Blazer with Cadre or Pursuit would be preferred over Cadre or Pursuit alone. When using Cadre or Pursuit, follow all labeled crop rotation restrictions.

[5] Generic brands of Prowl (pendimethalin) are available and perform similarly. Prowl or Sonalan can be used preemergence if 0.5-0.75" of water can be applied within 48 hours of application. They can be tank-mixed with Valor in this situation.

[6] If Valor or Spartan Charge is properly activated with 0.5-0.75" of rainfall or irrigation within 7 days of application, it is unlikely that an "at-cracking" treatment will be required. However, if control with Valor or Spartan Charge is unacceptable, an "at-cracking" treatment of Gramoxone Inteon or Firestorm or Parazone + Storm + Dual Magnum should be applied.

[7] Valor, Cobra, Spartan Charge, Storm, and Ultra Blazer have the same mode of action (PPO inhibitor). Consequently, no more than 2 applications of these herbicides should be used in a season.

[8] Dual Magnum can be tank-mixed with Cobra or Ultra Blazer if additional residual control is needed in these programs. However, a three-way tank-mix of Cobra or Ultra Blazer + Dual Magnum + 2,4-DB is not recommended.

[9] Generic brands of metolachlor are available (Stalwart, Parallel PCS, Me-Too-Lachlor). However, these generic brands have not provided the same length of residual control as Dual Magnum (S-metolachlor) in some UGA field trials. When tank-mixing paraquat, Cobra or Ultra Blazer with Dual Magnum/generics, additional spray adjuvants (NIS, COC) are not needed and will likely increase peanut injury.

THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION
College of Agricultural and Environmental Sciences
College of Family and Consumer Sciences

Peanut Response to Glyphosate

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Introduction

Since the introduction of glyphosate-resistant crops in 1996, glyphosate has become one of the most widely used herbicides in Georgia. Glyphosate is currently sold under many trade names, including Buccaneer®, Clearout®, Credit®, Durango™ , Glyfos®, GlyStar® Plus, Honcho®, Mirage®, Rattler®, Roundup PowerMax® and Touchdown Total®. In the late 1980s, glyphosate (Quotamaker™) was registered for use in peanut as a growth regulator/yield enhancer. However, Quotamaker™ did not become popular at the farm level and this particular registration for glyphosate was discontinued.

Today, because of the abundance of glyphosate that is applied to adjacent crops and that accumulates around pesticide mixing locations, it has become common for peanut fields to be unintentionally treated with this herbicide. This usually occurs in the form of spray drift or sprayer contamination (Figure 1).

Figure 1. A Georgia peanut field unintentionally treated with glyphosate. (Photo: Ray Hicks, Screven County Extension Coordinator, 2007)

This publication provides county agents, peanut growers, crop consultants and agri-business personnel with information that can assist them in making appropriate management decisions after a suspected glyphosate drift or sprayer contamination problem has occurred.

Glyphosate/Peanut Symptomology

When evaluating peanut fields for potential glyphosate drift/sprayer contamination problems, it is important to rule out other potential causes. Nutrient deficiencies and certain plant diseases can cause symptoms that often mimic herbicide injury. Examples of glyphosate injury symptoms on peanut plants are presented in the following pictures.

Glyphosate/Peanut Yield Effects

Estimated peanut yield losses caused by glyphosate applications (based upon recent field trials conducted at North Carolina State University and the University of Georgia) are presented in Tables 1 and 2. From these data, it is apparent that smaller, immature peanut plants may be more sensitive to lower glyphosate use rates than older plants.

Table 1. Estimated average peanut yield loss caused by glyphosate applied at 28 days after planting.[a]

Glyphosate Rate (oz/A) (4.0 lb ai/gal)	Glyphosate Rate (oz/A) (5.5 lb ai/gal)	Peanut Yield Loss (%)
2.8	2.0	10
5.5	4.0	15
8.3	6.0	21
11.0	8.0	26
16.5	12.0	38
22.0	16.0	49
24.0	17.5	53
32.0	23.2	69

[a]Adapted from Lassiter et al., 2007.

Table 2. Estimated average peanut yield loss caused by glyphosate applied 75-105 days after planting.[a]

Glyphosate Rate (oz/A) (4.0 lb ai/gal)	Glyphosate Rate (oz/A) (5.5 lb ai/gal)	Peanut Yield Loss (%)
2.8	2.0	0
5.5	4.0	5
8.3	6.0	12
11.0	8.0	24
16.5	12.0	36
22.0	16.0	48
24.0	17.5	53
32.0	23.2	70

[a]Adapted from Grey and Prostko, 2010.

Summary

Depending upon the rate and time of application, peanut plants can be very sensitive to glyphosate. Consequently, it is extremely important for growers to utilize drift reduction strategies when applying glyphosate near peanut fields. It is also critical that glyphosate containers be properly labeled and stored in order to minimize potential mixing errors that could result in undesirable sprayer contamination.

References

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Learning for Life

Circular 1007 **September 2011**

PEANUT DISEASE MANAGEMENT UPDATE

Bob Kemerait, Tim Brenneman, and Albert Culbreath

Note: Recommendations for use of specific fungicides follows introductory sections on disease and nematode management for 2012 in this chapter.

Effective management of diseases that affect the peanut crop is essential to peanut production in Georgia. Use of effective fungicides and nematicides to protect the peanut crop and maximize yields add to production costs; however such costs are far outweighed by the profit potential to the grower. It is imperative that growers carefully plan an effective strategy to manage diseases and nematodes; a plan that includes the use of crop rotation, selection of more-resistant varieties (see Peanut Rx section in the 2012 Peanut Update), selection of cost-effective fungicide and nematicide programs, and other factors that are a part of an overall integrated pest management program. The "best" management program may not be the least expensive, but rather is the program that gives the best return on investment to the grower. A perfect example relates to the use of "tebuconazole" in a fungicide program to manage soilborne diseases like white mold and Rhizoctonia limb rot. Tebuconazole is a "good" fungicide for the management of white mold and limb rot and is sold at price that is attractive to nearly every peanut grower in the state. Nonetheless, growers in some situations will increase the value of their peanut crop by investing in a fungicide that although more expensive, provides better total disease control increased yields.

The section below is written to provide growers with a detailed overview of many aspects of disease management in 2012.

Highlights from 2011 and notes for 2012.

1. **Tomato Spotted Wilt.** Losses to tomato spotted wilt were estimated to be approximately 0.5% for 2011; up only slightly from losses for 2010 (0.25%) which were the lowest 1990. Reasons for the continued decline of a disease that has had tremendous impact on peanut production in Georgia are unknown. However the extreme cold temperatures of the winters of 2009-2010 and 2010-2011 coupled with the widespread adoption of varieties with greater resistance to spotted wilt certainly played significant parts in the continued decline of this disease. **IMPORTANT NOTES: 1)** Although the severity of tomato spotted wilt has been in decline over the past several years, this disease continues to be a very real threat to peanut production in Georgia. Growers must continue to incorporate the lessons spelled out in Peanut Rx to minimize the threat from this disease. **2)** To date, the winter of 2011-2012 has been especially mild across Georgia; in large part due to the "La Niña" ENSO phase where winter temperatures in the southern United States are warmer than normal. Although a warmer winter does not necessarily mean that tomato spotted wilt will be more severe in 2012 than in 2010 or 2011, growers should be aware that the potential

for larger populations of thrips earlier in the season and subsequent increases in spotted wilt does exist.

2. As in 2010, **white mold** was severe in numerous fields in 2011. Very warm, even hot, soil temperatures early in the season led to aggressive development of the disease when the crop was still young. Though tempered a bit by extreme drought in some locations, aggressive development of white mold continued through much of the season.
    a. The most commonly asked questions from agents, consultants, and growers about disease control over the past three years have been about management of white mold.
    b. As a reminder, the basic steps to minimizing the impact of white mold in a field include:
        i. Rotation away from peanuts and soybean; it is recommended that peanuts not be planted in a field more than one out of three years.
        ii. Selection of newer peanut varieties with improved resistance to white mold, for example 'Georgia-07W' (see the chapter on the 2012 Peanut Rx).
        iii. Use of a fungicide program that has an appropriate compliment of fungicides for white mold control recognizing that some fungicides offer the potential for better control than others.
        iv. Appropriate timing of fungicide applications to correspond with the growth of the crop, the threat from white mold (based upon soil temperature and rainfall/irrigation) and the anticipation of rain events or irrigation to help move the fungicide from the foliage to the crown of the plant.
        v. Growers whose standard white mold program includes Abound, Headline (for soilborne disease control), Evito, Artisan, or Convoy may wish to consider an application of tebuconazole (7.2 fl oz/A) + cholorothalonil (1.0 pt/a) approximately 44 days after planting to get an "early jump" on white mold control. Such an application would be followed by the full-season white mold program.
        vi. Application of fungicides for the control of white mold at night or in the early morning hours when the leaves are still folded. Such allows better penetration of the canopy so that more of the fungicide reaches the crown of the plant.
        vii. Use of Proline 480SC (5.7 fl oz/A) during the period of "early emergence". Research efforts at the University of Georgia in 2010 and 2011 have documented that applications of Proline (5.7 fl oz/A "broadcast rate" BANDED over young plants 2-5 weeks after planting) can have a significant and season-long benefit for management white mold. See next point for initial information on an early emergence application of Proline.
3. The active ingredient in **Proline 480SC** is prothioconazole. (Note: Prothioconazole and tebuconazole are the active ingredients in Provost fungicide.) Applied in-furrow at planting, Proline aides in the management of Cylindrocladium black rot (CBR). However, when applied to the peanut crop

AFTER emergence at a broadcast rate of 5.7 fl oz/A BANDED at the full rate over the young peanuts, Proline can provide season long benefits to the management of white mold and possibly Rhizoctonia limb rot as well. As the early-season application of Proline for disease control is a new recommendation from the University of Georgia, growers should **carefully** consider the following points:

a. An early season application of Proline contributes to the overall management of white mold; however it is unlikely to provide all of the control that is needed. Early-season applications of Proline should be followed by a standard soilborne fungicide program. **NOTE:** If Proline is applied during the early season growers may need to include fungicides like Artisan, Convoy, Abound, Headline or Evito to full-season "triazole" programs for fungicide resistance management.
b. Once again, the rate of Proline is 5.7 fl oz/A. This FULL RATE should be banded over the young peanuts planted in either single rows or in twin rows (20-40 GPA). If planted in twin rows, the fungicide can be applied with either a single nozzle covering both twins at once (20-40 GPA) or with a single nozzle over each of the twin rows (10-20 GPA/nozzle). Growers should use an "even flat-fan" tip for this application.
c. Timings for early-season applications of Proline have been evaluated between two weeks and five weeks after planting. Although each of these timings can offer increased white mold protection, in 2011 the level of white mold control and subsequent yield benefits on early planted peanuts increased as the application was delayed; i.e., the best results were observed five weeks after planting. The value of specific timings is likely to vary from season to season based upon planting date and weather conditions early in the season.
d. Early-season applications of Proline can provide protection against leaf spot as well as against white mold.
    i. For growers following a 4-5 week-after-planting application of Proline with a Provost program, Bayer Cropscience recommends waiting 21 days and then simply making the first Provost application (approximately 55-60 days after planting).
    ii. For general fungicide programs, an early season application of Proline can be followed 2-3 weeks later with a fungicide application for management of leaf spot. The full-season white mold program should commence at about 60 days after planting.

4. **Cylindrocladium black rot (CBR)** was scarce again in 2011, certainly because of extremely warm soil temperatures early in the season. **Rhizoctonia limb rot**, inconsequential in 2010, did occur at damaging levels in some fields in 2011. The University of Georgia Cooperative Extension will monitor the development of both diseases closely in 2012.
5. **"Prescription"** fungicide programs with 4, 5, or 7 fungicide applications continued to be effective even in a heavy white mold year when used in fields with appropriate risk (based upon Peanut Rx). In 2011, Peanut Rx prescription fungicide programs will be supported by Syngenta Crop Protection, Nichino-

America, Arysta LifeScience, BASF, Bayer CropScience and Sipcam Agro. **Peanut Rx**, with a few modifications for 2012, can be found elsewhere in the 2012 Peanut Update.

6. **Loss of Temik 15G.** Bayer CropScience announced that Temik 15G announced in 2011 that Temik 15G would no longer be produced and only what was already in distribution would be available to growers. Given the important role that Temik 15G plays in the management of peanut root-knot nematodes, the loss of Temik for peanut production will have significant impact on peanut production in Georgia. Recent reports indicate that another formulation of aldicarb (the active ingredient in Temik 15G) has received a label from the EPA and will be imported from China beginning in 2012. "Meymik", as the product will be known, will not be here in time for planting in 2012, but should be generally available later in the year and for the 2013 season.

Specific Fungicide Notes for 2012

1. Fontelis (penthiopyrad) is a new fungicide from DuPont and should be available to peanut producers by late February 2012. Researchers at the University of Georgia have conducted extensive field tests with this product and have found it to be a very effective fungicide against common peanut diseases such as white mold and leaf spot. Fontelis will likely be applied in three applications (16 fl oz/A each) during the season for management of soilborne and leaf spot diseases. Below are specific reasons why growers should consider using Fontelis in 2012.
    a. Fontelis has broad-spectrum activity and can be used in the management of leaf spot diseases, white mold, Rhizoctonia limb rot, and CBR.
    b. Penthiopyrad, the active ingredient in Fontelis, is in a different fungicide class than are fungicides like Provost, Proline, Quash, tebuconazole, Abound, and Evito. Because of this, Fontelis will play an important role in fungicide resistance management.

2. Generic tebuconazole products (tebuconazole was the active ingredient in Folicur and is the active in many products such as Tebuzol, Monsoon, Savannah, Muscle, Orius, etc.) were among the most popular fungicides used in last season. The popularity of tebuconazole last season was certainly enhanced by the lower cost of an application versus the cost of other products. **In 2012, growers should note the following about tebuconazole:**
    a. The cost of tebuconazole fungicides will keep them popular with growers.
    b. Tebuconazole remains an effective fungicide for management of soilborne diseases and, when tank-mixed with another fungicide, for control of leaf spot diseases.
    c. Overuse of tebuconazole without regards to fungicide resistance management will likely lead to a continued decline in the efficacy of this important fungicide.

d. Tebuconazole is often an effective tool but is not the best fungicide available for the management of any of our important diseases. In selecting an appropriate fungicide, growers should weigh the cost of tebuconazole against the value of enhanced disease control with other fungicides. **The severe outbreak of white mold in 2011 clearly demonstrated that peanut growers in Georgia have access to fungicides that have increased efficacy against white mold than does tebuconazole.**
e. In a year like 2011, growers commonly asked about the potential benefits of significantly increasing the rate of tebuconazole (beyond 7.2 fl oz/A) to take advantage both of the "expected" benefits of the higher rate and the cost of the product. The University of Georgia Cooperative Extension in NO WAY condones the use of tebuconazole products at rates beyond 7.2 fl oz/A. Not only is this application rate off-label and thus illegal, but we have no data to support improved efficacy anyway with a rate higher than 7.2 fl oz/A. In short, growers who choose to use tebuconazole MUST use it at the 7.2 fl oz/A rate.

Management of peanut root-knot nematodes in 2012

1. Peanut root-knot nematodes are frequently under-managed in Georgia, either because the symptoms are not recognized or because growers are reluctant to take the steps needed to ensure adequate control.
2. Rotation with a crop such as cotton (not a host for peanut root-knot nematode) is a very effective management tool.
3. Growers planting peanuts in fields with damaging levels of peanut root-knot nematodes MUST consider planting 'Tifguard'. Tifguard is nearly immune to the peanut root-knot nematode, does NOT need to be treated with a nematicide, and performs exceptionally well as compared to other varieties that are treated with nematicides.
4. Growers who plant the new peanut variety 'Tifguard' can expect excellent control of nematodes. Note: the concern that some have expressed over "weak peg strength" in Tifguard remains unproven; growers should give significant importance to the near-immunity of this variety to peanut root-knot nematodes and keep any concerns about peg-strength in proper perspective.
5. Fumigation with Telone II (4.5-6 GPA) is our most aggressive treatment to manage peanut root-knot nematodes and provides our best opportunity to manage nematodes affecting peanut IF the grower does not plant Tifguard.
6. Temik 15G (if available), applied both at planting and at-pegging stages, is a critical tool in many areas. Growers who use Temik 15G in 2011 need to carefully familiarize themselves with new use requirements such as maxim use amounts, pre-harvest application intervals, distance from well-heads and water sources, and requirement for irrigation or rainfall within 24 hours after a pegging-time application.
7. NemOut, a biological nematicide, will no longer be available to peanut growers.

8. “Enclosure” (iprodione) is a new product being sold for the management of plant parasitic nematodes on peanut. The parent company of this product, Devgen, continues to invest significant resources in field trials to assess the efficacy of Enclosure on peanuts in our state. Again, as more research results become available, they will be shared with growers, county agents, and consultants.

Management of Peanut Diseases

Although a few growers may have experienced severe outbreaks of tomato spotted wilt in their fields in 2011, this troublesome disease was once again of minimal impact in peanut fields across the Southeastern US. It is estimated that that the incidence of tomato spotted wilt on peanut last season in the Georgia-Florida-Alabama region was about 0.5%. Despite low levels of spotted wilt in 2006, 2007, 2008, 2009, 2010 and 2011, growers should not become complacent in management of this viral disease. Without taking proper management precautions, growers could experience heavy losses to spotted wilt in 2012. Peanut Rx, the peanut disease risk index developed through collaborative efforts at the University of Georgia, the University of Florida, and Auburn University, has been updated for 2012 and offers growers strategies to minimize risk to not only spotted wilt, but leaf spot, Rhizoctonia limb rot, and white mold as well. The complete 2012 Peanut Rx is presented elsewhere in this Peanut Update.

White mold was the most important disease of peanuts in Georgia in 2008, 2009, 2010 and again in 2011. In 2011, white mold began to develop very early in the season and caused great concern for many growers and considerable losses in some fields. Many of the questions from peanut growers to the Cooperative Extension offices in July and throughout August dealt with management options for this disease. The key to the outbreaks of white mold in 2008, 2009, 2010 and 2011 were very warm temperatures in May and June which fueled the disease. Warm soil temperatures are an important factor in the development of white mold. Rainfall and irrigation certainly increase the potential risk and severity of this disease; however white mold can cause much damage even in a drier year when warm soils are common. In drier year, white mold is likely to cause most of its damage to the pods and pegs lying below that ground as it may be too dry in the above-ground canopy.

In managing white mold, note the use of the word “managing” and not “controlling” white mold, growers should not expect 100% effectiveness from any program. It is estimated that 70% control is all that can be expected in the best of situations and 50% control may be all that can be achieved when environmental conditions and factors such as poor crop rotation increase the risk to the disease in a field.

It is extremely difficult to protect a peanut crop from isolated “hits” of white mold in any field. Depending upon the crop rotation in the field, the variety of peanut planted, and the environmental conditions (e.g. weather) during the growing season, a field may have many isolated hits of white mold or fewer hits. An effective fungicide program (to

include use of an appropriate fungicide applied at the proper timing with an appropriate spray volume) should minimize the spread of white mold in a field. A grower should be concerned if he notes “runs” of white mold across the field that are several feet in length, or longer, despite use of a soilborne fungicide.

New Tools for Disease Management

Peanut growers will have the opportunity to use some new and/or updated tools again in 2011 to further their battle against diseases and nematodes.

1. **Early-season applications of Proline** fungicide are discussed at the beginning of this section.
2. **“Day versus Night spraying”:** Research began in 2007 and was continued in 2008, 2009 and 2010 (both in small plots and in large, on-farm studies) to assess the benefits and potential consequences of spraying fungicides at night for control of soilborne diseases. Because the peanut leaves “fold up” when it is dark, thus opening the interior of the canopy, it is thought that fungicides applied at such time would have better chance of reaching the crown of the plant. For management of soilborne diseases like white mold and Rhizoctonia limb rot, the crown of the plant is targeted for optimum control. Also, it is thought that by spraying fungicides directly into the crown of the plant, the fungicide residues are protected to some degree from sunlight, thus reducing photodegradation and extending the period of efficacy. Below is a summary of findings from the University of Georgia with regards to spraying at night.
    a. Control of white mold can be significantly improved by spraying the peanuts at night or in the early morning hours before sunrise. Provided that the fungicide applied at night has systemic activity, i.e. moves within the leaf tissue, there is no significant reduction in leaf spot control, and yields can be significantly improved with night sprays. When sprayed at night, “protectant” fungicides like chlorothalonil and Elast (dodine) will not provide adequate control of leaf spot diseases.
    b. Improvement of white mold control is more evident in non-irrigated plots than in irrigated plots when fungicides are applied in darkness, though there is likely to be benefit in both situations.
    c. Spraying in the early morning hours before dawn tends to offer slightly better results than in spraying in early evening. It is believed that the dew in the early morning further aids in the relocation of the fungicide.
    d. It is believed that applying fungicides at night will either maintain yields and control of white mold and leaf spot diseases or improve white mold control and yields as compared to daytime applications. There is believed to be little risk to the grower by applying appropriate fungicides at night, other than loss of a sound sleep!
    e. Note: Only fungicides applied for control of soilborne diseases should be considered for application at night. Fungicides applied only for control of leaf spot diseases and rust should continue to be applied during the day.

f. **Final note: growers must ensure that any fungicide or combination of fungicides applied at night has systemic activity against leaf spot diseases.** Without systemic activity (e.g. a mix of Convoy and chlorothalonil which does not have systemic activity) applying a fungicide at night could lead to a reduced level of leaf spot control. In the previous example, a more appropriate combination would be Convoy a fungicide such as Stratego, Headline, Topsin M + chlorothalonil, Tilt/Bravo, etc.

3. **The 2012 "PEANUT Rx" Disease Risk Index** is now available and has been thoroughly reviewed and revised as needed by researchers, breeders, and Extension specialists from the University of Georgia, the University of Florida, and Auburn University. Only a few changes were deemed necessary and included and update of the risk points and varieties (Bailey, FloRun™ '107' and Georgia-09B) that were included in the Index, and a slight reduction in risk to tomato spotted wilt for when more resistant varieties are planted at 3-4 seed/ft. All other points/categories remained unchanged from 2010. Specific changes include:
4. **"Prescription Fungicide Programs"**, i.e. specific disease management programs with an increase or decrease in fungicide applications based upon the 2012 "PEANUT Rx", continues to gain support from the agrichemical industry. In 2012, Syngenta Crop Protection (Abound, Bravo WeatherStik, Tilt/Bravo), Nichino (Artisan, Convoy), Arysta LifeScience (Evito), BASF (Headline), Bayer CropScience (Provost) and possibly Sipcam Agro will support prescription programs (4, 5, and 7 applications) for fields determined to be at low, moderate, or high risk according to PEANUT Rx. Prescription programs using fungicides not from Syngenta or Nichino can also be used successfully by growers; however they would not be endorsed or supported by any company.
5. **Recommendations for the management of CBR** continue to develop as new tools become available. PROLINE (5.7 fl oz/A) is a promising component of a complete fungicide program to reduce the impact of Cylindrocladium black rot (CBR) in a field. With the availability of PROLINE, a good integrated pest management program for growers who wish to manage CBR is to
    a. practice good crop rotation (i.e. rotation away from peanuts and soybeans),
    b. consider planting a variety with some resistance to CBR such as Georgia-02C and Georgia Greener,
    c. use PROLINE, 5.7 fl oz/A in-furrow, at planting, followed by
    d. 4-block program of PROVOST or at least use of a fungicide program that offers suppression of CBR (e.g. Folicur, Abound, or Headline).

CROP ROTATION

The practice of good crop rotation has always been at the foundation of optimum disease management in peanut, affecting not only nematodes and soilborne diseases, e.g. white mold, Rhizoctonia limb rot, and Cylindrocladium black rot, but leaf spot diseases as well. For this reason, Extension specialists at the University of Georgia stress the importance of avoiding planting peanuts in the same field more often than

once every three years and rotating with a grass crop, e.g. bahiagrass or corn, if at all possible.

Since the recent change in the Peanut Farm Program, peanut farming in Georgia has expanded into “non-traditional” production areas in the southeastern portion of the state. Growers in this area frequently ask “Can I grow peanuts on my land in back-to-back seasons as I have not grown them here before?” The simple answer is, of course, you can plant peanuts on your land whenever you want to. However, even growers who are planting peanuts on “new peanut ground” should be discouraged from back-to-back peanuts if possible. Reasons for this include:

1. Many peanut growers around the state would love to have access to “new peanut ground” as populations of pathogens attacking the crop should be initially low. Therefore, it does not make much sense to lose this competitive edge in pursuit of the short-term goal of growing two or three crops of peanuts in succession.

2. Many new peanut growers are producing peanuts on land that has been cropped to cotton in recent years. Although cotton is not affected by the peanut root-knot nematode, early or late leaf spot, or Cylindrocladium black rot (CBR), and is only slightly affected by white mold, it is susceptible to diseases caused by *Rhizoctonia solani*. It is likely that despite previous cropping in a field, there will be significant populations of *R. solani* and perhaps smaller populations of *Sclerotium rolfsii* (white mold) in the field when peanuts are first planted. (This was observed in a test plot in Lanier County in 2004.) Without effective crop rotation, these populations may increase quickly.

3. In 2005, we observed an outbreak of CBR in a field in southeast Georgia planted for two consecutive years to peanut, but had not been planted to peanut at any other time. Earlier crops of soybean had introduced this disease to the field and back-to-back years of peanut had intensified the problem.

One of the greatest benefits of crop rotation is that it increases the effectiveness of all disease management programs. Effective crop rotation takes some of the “pressure off” of a fungicide program to minimize the impact of disease. Any fungicide program will be more effective where good crop rotation is practiced. In some situations, fields that are well rotated will require fewer, or at least less expensive, fungicide applications by the grower.

Recommendations from the University of Georgia for crop rotation and peanut production include the following:

1. Avoid planting peanut in the same field more than once out of every three years. Longer rotations, for example once every four years, are even better.

2. The best crops to rotate with peanut are grass crops, such as corn, sorghum, and bahiagrass. These crops will help to reduce the severity of diseases caused

by Rhizoctonia solani, as well as CBR, white mold, and leaf spot diseases. Although corn and sorghum are alternate hosts for the peanut root-knot nematode, they are less affected than peanut is. Therefore, planting corn and sorghum should help to reduce populations of peanut root-knot nematode, though perhaps not as fast as when a non-host such as cotton is planted. Bahiagrass is susceptible to the lesion nematode, which can reduce the pod brightness important for the green peanut market.

3. Cotton is a very good rotation crop with peanut and should help to reduce the severity of white mold, leaf spot diseases, and CBR on future crops. Cotton is not a host for the peanut root-knot nematode, so this will be a beneficial effect as well. Cotton is a host for *Rhizoctonia solani*, so diseases caused by this pathogen will remain a concern in peanut-cotton rotations, especially in conservation tillage where crop debris remains on the surface.

4. Soybeans, other leguminous crops, and many vegetable crops are not preferred for rotation with peanut. Although such rotations are likely to reduce the severity of leaf spot diseases, they may not reduce the severity of white mold, Rhizoctonia limb rot, the peanut root-knot nematode, or, in the case of soybean, CBR.

DISEASE MANAGEMENT IN 2012

Tomato Spotted Wilt. Every year growers are reminded that the goal of PEANUT Rx is to minimize their risk point total for a specific production field. PEANUT Rx does not dictate when a grower *must* plant peanuts, for example in the middle of May. The purpose of the index is to allow growers to determine how to minimize their point totals given their own needs. For example, if a grower needs to plant in late April, he or she can still achieve a satisfactory point total by making adjustments to other parts of the index, such as selection of a more resistant variety.

Fungal Diseases. Good crop rotation remains the cornerstone of a good disease management program. We recommend that a grower plant peanuts in a field only once every three years, and once every four years is even better. Grass crops, such as bahiagrass and corn, are the best rotation crops with peanuts because they do not share the same diseases or pathogens. (Note: Bahiagrass is a host for the lesion nematode, which does affect peanuts, especially green peanut growers.)

Early and Late Leaf Spot Diseases. Both early and late leaf spot are commonly observed across Georgia's peanut production region.

Management Points for Leaf Spot

1. Practice good crop rotation.
2. Destroy any volunteer peanuts that may grow in a field and bury/remove old peanut hay that can serve as a source of spores for leaf spot diseases.

3. Do not delay the start of a leaf spot fungicide program.
    a. When using chlorothalonil (e.g. Bravo Ultrex, Bravo WeatherStik, Echo, Equus, or other generics), Tilt/Bravo, Echo-PropiMax, Stratego, Elast 400F, Eminent 125SC + Echo, or Headline (**at 6 fl oz/A**), and you have adequate crop rotation, your first leaf spot spray will typically be applied somewhere between 30 and 35 days after planting (unless weather has been dry and unfavorable for development of foliar diseases.
    b. In fields where risk to leaf spot has been calculated as low-to-moderate, we have maintained good control of leaf spot when using a single application of Tilt/Bravo (2.5 pt/A) 40 days after planting
    c. Growers who use the AU-pnut forecasting system, automated at www.AWIS.com, can more effectively time their first application based upon environmental conditions.
    d. If you are planting peanuts after peanuts, you will likely need to begin your leaf spot program earlier than 30 days after planting because of the increased risk of disease.
    e. If you are using Headline (**at 9 fl oz/A**) for your first leaf spot spray, it is appropriate to combine your first two fungicide applications for leaf spot control (for example at 30 and 44 days after planting) into a single application of 9 oz of Headline at 38-40 days after planting.
4. Traditionally, fungicides are applied on a 14-day calendar schedule beginning after the first application. This 14-day interval may be modified for reasons such as those below:
    a. The interval should be **shorter** than every 14-days if conditions:
        i. Rainfall has been abundant and conditions are favorable for leaf spot.
        ii. You are using the AU-PNUT leaf spot advisory and it calls for an early application.
        iii. Peanuts follow peanuts in a field and leaf spot is expected to be severe.
        iv. Rainfall came on quickly after your last leaf spot spray and you are concerned that some of the fungicide may have been washed off the plants in the field too quickly.
        v. You are planting a variety that has poor resistance to leaf spot diseases.
        vi. Peanut rust appears in your field prior to the end of the season.
    b. It may be possible to extend the spray interval **beyond** 14-days if:
        i. Conditions have been dry and unfavorable for leaf spot, especially if you use the AU-PNUT advisory for spray guidance.
        ii. You are using a variety with increased resistance to leaf spot, such as York, Georgia-07W, or Georgia-03L. For example, if pressure from soilborne diseases is not severe, the spray interval for such varieties could be every 21 days and it is possible to treat the most resistant varieties only three times

during the season. (Additional information can be obtained from your local Extension Agent).

iii. **You use Peanut Rx and determine that the predicted risk of fungal disease in a field is low to moderate** and rainfall has not been excessive since your last spray (additional information can be obtained from your local Extension Agent).

iv. Since many fungicide applications are used to manage leaf spot diseases and soilborne diseases, one must consider the effect that an extended spray schedule would have on both types of disease (foliar and soilborne) BEFORE shifting from a 14-day schedule.

5. The "**funky leaf spot**", whose cause is still unknown, typically affects peanut plants very early in the season and can look very much like early leaf spot. It may also cause considerable defoliation of early season foliage. Because this disease typically disappears by the middle of the season, it has not been found to be of real concern. Funky leaf spot has been found to be most severe on peanut varieties such as Georgia-02C and Georgia-03L, but is not thought to cause yield loss for either.
6. Current fungicides DO NOT control **funky leaf spot**; so do not be unduly alarmed by the appearance of leaf spots on your peanuts early in the season. Stay on a good fungicide program and have confidence that this program will control the more important early and late leaf spot diseases.
7. Finding some leaf spot in a field at the end of the season is usually not a problem. As long the diseases are controlled throughout the season, limited defoliation (up to about 30-40%) is not likely to affect your yield. The appearance of leaf spot at the end of the season typically does not mean that your program was ineffective or a failure.
8. Some growers in Florida are mixing chlorothalonil with Topsin-M or Topsin 4.5F or copper fungicides such as Kocide for their final leaf spot sprays to increase peg strength prior to harvest. What do we recommend in Georgia?
    a. Combinations of chlorothalonil and Topsin-M currently provide excellent control of leaf spot.
    b. Combinations of chlorothalonil and copper are also effective in the control of leaf spot.
    c. Data collected at Clemson University demonstrates that peg strength is not increased with use of Topsin-M, Topsin 4.5F, or copper (e.g. Kocide).
9. Failures in leaf spot management in a peanut field are often linked to:
    a. Unacceptable delays in starting your program.
    b. Improper calibration of equipment (not enough material was applied).
    c. Unacceptable delays between applications, such as when weather conditions keep the grower out of the field.
    d. Rain events immediately after a fungicide application have washed the fungicide away too quickly.
10. Use of Chlorothalonil.

a. **Chlorothalonil** is the active ingredient in Bravo products, Echo products, and a number of generics. It is quite effective in the management of leaf spot diseases. Key points:
    i. All chlorothalonil products for peanut appear to be effective. Differences between one brand and another are related to the "stickers" and other substances that are added to the active ingredient to increase effectiveness.
    ii. There is no difference in efficacy between a flowable and dry-flowable formulation of chlorothalonil.
    iii. Two likely benefits from chlorothalonil products when compared to other products for leaf spot control are:
        1. Price.
        2. Use for fungicide resistance management.
    iv. The typical rate for a 720-F formulation is 1.5 pt/A; for a 90-DF formulation is 1.4 lb/A.
    v. Chlorothalonil products are not systemic and must be applied to the leaf surface prior to infection by the fungus.
    vi. Generally, chlorothalonil products have been on the foliage long enough prior to a rain event IF they have had time to dry completely.
    vii. If you feel that your chlorothalonil application may not have had enough time to dry before rain, consider timing your next fungicide application a little earlier to compensate for any reduction in efficacy.
    viii. When conditions have been very favorable for leaf spot (a lot of rain), it is generally true that research plots treated with chlorothalonil will have more leaf spot at the end of the season than plots treated with a systemic fungicide for leaf spot control. This increase in leaf spot rarely results in a reduction in yield.
    ix. Tank mixing Topsin M with chlorothalonil provides a good option for growers who are looking for a "rescue treatment" when leaf spot is developing too quickly in their field.

11. Use of **Elast 400F**:
    a. Elast (dodine) is in a fungicide class different than others used in peanut production. Thus when used in a peanut program it can help to reduce the chances of fungicide resistance that occur with overuse of certain "at risk" fungicides.
    b. Elast is a "protectant" fungicide like chlorothalonil and must be applied before infection by leaf spot pathogens has occurred. If infection has already occurred, application of Elast will be of minimal benefit for disease control.
    c. Elast is used at either 15.0 fl oz/A alone or at 12.8 fl oz/A when tank-mixed with a product like tebuconazole (7.2 fl oz/A) for additional leaf spot control.
    d. Use of Elast is most appropriate where chlorothalonil would be used.

e. Elast is MOST effectively used earlier in the season. Full-season use of Elast has been found in some trials to lead to reduced management of leaf spot diseases when compared to other fungicides applied for leaf spot control.
f.

12. Tilt/Bravo, Echo-PropiMax, Eminent-Echo and Stratego:

a. Propiconazole + chlorothalonil is marketed as two products, Tilt/Bravo and Echo-PropiMax.
    i. The rate of this combination is 2.0 fl oz of propiconazole and 1.0 pt of chlorothalonil/A.
    ii. Tilt/Bravo is now marketed as a pre-mix which when applied at 1.5 pt/A, offers the same level of product as described above.
    iii. Tilt and PropiMax are systemic, which means that they can be absorbed into the leaf tissue offering some limited curative activity for recent infections.
    iv. Fungicide resistance management: improper use of Tilt/Bravo or EchoPropiMax with Folicur or Stratego may increase the risk of resistance to the sterol-inhibitor class of fungicides.
b. Propiconazole + trifloxystrobin is marketed as Stratego.
    i. Stratego is also a systemic fungicide with limited curative activity.
    ii. For leaf spot control, Stratego is applied at a rate of 7.0 fl oz/A.
    iii. Fungicide resistance management: improper use of Stratego with Folicur, Tilt/Bravo, Echo-PropiMax, Abound or Headline will increase the risk of resistance to the sterol-inhibitor and strobilurin classes of fungicides.
c. Eminent 125SC (tetraconazole) + Echo is a new co-pack from Sipcam and offers leaf spot control similar as other products mentioned in this section.
d. Where do we see the best fit for these products?
    i. Even though these fungicides have a systemic component, they should be applied BEFORE infection occurs in order to obtain maximum benefit.
    ii. When conditions for leaf spot are favorable, use of Tilt/Bravo, Echo-PropiMax, Eminent 125SC + Echo or Stratego often provides for better leaf spot control than with chlorothalonil alone.
    iii. If growers plan to use one of these fungicides, they are often used early in the season to help insure a good start to leaf spot management.
    iv. If conditions have been favorable for leaf spot (abundant rainfall), a grower has been delayed in spraying for leaf spot, or leaf spot is beginning to appear in the field, use of Tilt/Bravo, Echo-PropiMax, or Stratego may provide benefits beyond chlorothalonil.
    v.

13. **Topsin-M** (thiophanate methyl) is a fungicide in the benzimidazole class.
    a. Topsin-M can be a very effective part of a leaf spot management program.
    b. Growers who use a 4-block tebuconazole program can increase the control of leaf spot by tank-mixing 5.0 fl oz/A Topsin-M with 7.2 fl oz of tebuconazole in alternating applications (either 1 & 3 or 2 & 4).
    c. Growers who use a 4-block Artisan program (13-16 fl oz/A on each of four applications, may also want to consider using Topsin as described above.
    d. Growers who are looking for an effective fungicide treatment, should leaf spot become a problem in a field, can make an application of Topsin-M (5.0-10.0 fl oz/A) tank-mixed with 1.5 pt/A chlorothalonil. This can be followed up with a second application of the same tank-mix or with an application of Tilt/Bravo.
    e. Growers should make no more than two tank-mix applications of Topsin-M pert season in order to avoid fungicide resistance problems.
14. Pyraclostrobin is sold as **Headline**.
    a. Headline has been the most effective fungicide labeled on peanut for management of leaf spot.
    b. **NOTE:** Because Headline is our current standard for control of leaf spot diseases, some growers forget that Headline at rates of 12-15 fl oz/A is also an effective white mold/Rhizoctonia limb rot material as well. Growers who incorporate a higher rate of Headline into their fungicide program can expect excellent leaf spot control and effective soilborne disease control as well.
    c. Headline has the best curative activity of any fungicide for control of leaf spot.
    d. Fungicide resistance management: improper use of Headline with Abound, Evito, or Stratego will increase the risk of resistance to the strobilurin class of fungicides. In most cases, Headline should not be used in a fungicide program that contains Abound, Evito, or Stratego.
    e. For leaf spot control, Headline is typically used as follows:
        i. Two applications at 6.0 fl oz/A at approximately 30 and 44 days after planting. We generally do not spend much time with this pattern, as the one below is a much better option for the grower.
        ii. Combine two traditional leaf spot fungicide applications into a single application at 9.0 fl oz/A approximately 38-40 days after planting.
        iii. Note: Because of its power to control leaf spot, some growers have used Headline as a “salvage” treatment late in the season when leaf spot appears out-of-control in a field. Remember:
            1. It would have been better to use the Headline earlier to try and avoid the problem entirely.
            2. Headline may slow the epidemic of disease, but it will not cure the problem. You will still have leaf spot; perhaps

not as much as you would have had if you had not treated with Headline.

3. Using a selective fungicide, such as Headline, when disease is present and severe will increase the risk for the development of fungicide resistance.

13. **Abound, Evito, Provost, Quash** (metconazole)and tebuconazole products are typically considered to be for control of soilborne diseases; however they must also control leaf spot diseases as well. Provost, Abound, and Evito provide effective leaf spot protection alone. Although Quash (metconazole) alone may also provide adequate leaf spot control, where growers who have experienced leaf spot problems when using tebuconazole can assume that similar problems will exsit with Quash unless it is tank-mixed with another fungicide for increased leaf spot control. Problems associated with tebuconazole and leaf spot are usually related to fungicide resistance issues or are traced back to rain or irrigation soon after application. To maximize leaf spot and white mold/limb rot control with Folicur/tebuconazole, it is best that the crop dry for 24 hours before irrigation. Where rainfall is abundant and/or resistance is likely, most growers will add a half-rate of chlorothalonil or Topsin to 7.2 fl oz/A of tebuconazole for added leaf spot protection.

SOILBORNE DISEASES

White Mold and Rhizoctonia Limb Rot Diseases: White mold will likely to occur in nearly every peanut field in Georgia; Rhizoctonia limb rot can be an important problem in some fields. Losses caused by these diseases can be severe and they are much more difficult to control than leaf spot diseases. Prior to 1994 when Folicur was first labeled, growers did not have any truly effective fungicides to control theses diseases. Since 1994, growers now have six different fungicides from three different classes that can effectively control both white mold and Rhizoctonia limb rot. Still, white mold and limb rot remain troublesome to growers. Two of the reasons for difficulty in control are 1) it can be tough to tell when you need to begin spraying, and 2) it is not easy to get the fungicide to its target where it can affect the pathogen.

Management points for white mold and Rhizoctonia limb rot.

1. Practice good crop rotation.
    a. Corn, grass crops, and bahiagrass are good rotation partners reducing effect of white mold and Rhizoctonia limb rot.
    b. Cotton will reduce the risk of white mold but will have less benefit on Rhizoctonia limb rot.
2. Choose resistant varieties when available.
    a. Some new varieties, such as Georgia-02C and Georgia-07W, have increased resistance to white mold over Georgia Green.
    b. Georgia Green appears to have better resistance to Rhizoctonia limb rot than many other varieties.

3. Consider an application of Proline 480SC (5.7 fl oz/A) early in the season (2-5 weeks after planting) and follow it with a traditional fungicide program. More information is available at the first of this section.
4. Apply fungicides for control of soilborne diseases at night when leaves are folded to allow greater penetration to the crown of the plant. Soilborne diseases are most effectively controlled when the fungicide reaches the crown and lower limbs of the plant.
    a. Fungicides applied in late evening for management of soilborne diseases are at least as effective, and often more effective, then the same fungicides applied during the day.
    b. Fungicides applied for management of soilborne diseases appear to be most effective when applied early in the morning after dew set, but before daylight. The moisture from the dew seems to further help in the re-distribution of the fungicide on the crown and limbs of the crop.
    c. Because fungicides applied for control of soilborne diseases must also protect against leaf spot diseases as well, it is important that the grower use a fungicide, or tank-mix an additional fungicide, that has systemic movement in the leaf.
    d. All “leaf spot only” fungicide applications should be applied during the day to achieve maximum coverage of the leaves.
5. Use appropriate fungicides.
    a. NOTE: No fungicide program will give the grower complete control of soilborne diseases in a field. We estimate that, at best, a good soilborne fungicide program will give 60-70% control under ideal conditions.
    b. Initiating fungicide applications is often imprecise and is based upon experience.
    c. The timing of fungicides for controlling white mold and limb rot must be early enough to protect the crop when the disease first appears. However, growers should avoid applying soilborne fungicides too early so that they will be available when needed later in the season.
    d. Initial appearance of soilborne diseases is related to the soil temperature, the growth of the crop, and rainfall/irrigation.
    e. In Georgia, we generally start spraying for soilborne diseases approximately 60 days after planting. At this time in the season, the growth of the crop and the environmental conditions are suitable for disease to occur. Because white mold and Rhizoctonia limb rot can occur earlier than this, the grower should watch his fields carefully to determine when the diseases appear.
    f. Example: In 2003, rainfall was abundant and we predicted that severe white mold would occur early in the season. However, white mold did not appear until later in the season and was much of a late-season problem. The most probable reason for this was temperature. Although the moisture was suitable for white mold (and limb rot), the cooler-than-normal summer temperatures delayed the onset of white mold. In 2006, white mold was severe across much of the production

region of Georgia despite dry conditions. Again, the warm soil temperatures resulted in outbreaks of white mold, though the drought reduced the severity of Rhizoctonia limb rot.

g. Fungicides are applied to the foliage, but must reach the crown and limbs of the plant in order to be effective against soilborne diseases.
    i. The fungicides can be moved by rainfall and irrigation. If rainfall or irrigation occurs too quickly after application, the fungicide may not provide enough protection for leaf spot.
    ii. If the rainfall or irrigation is delayed, absorption of the fungicide into the foliage may reduce the amount available to fight soilborne disease.
    iii. In a dryland situation, lack of rainfall, and thus movement down the plant, will reduce the effectiveness of a soilborne fungicide. Still, the fungicide was probably not wasted; some of the product likely reached the desired target with the spray mix.
    iv. If fungicides are applied during the night after the leaves have folded, more fungicide will reach the crown of the plant where it is needed to control soilborne disease.
h. Management with **tebuconazole**.
    i. Tebuconazole is marketed as Folicur, Tebuzol, Orius, Tri$um, Integral, Muscle, Tebustar, etc.
    ii. Tebuconazole is effective against white mold and Rhizoctonia limb rot.
    iii. Tebuconazole remains effective against early and late leaf spot; however the fungicide is not as effective as it once was due to development of resistance by the fungal pathogens.
    iv. It is recommended that tebuconazole remain on the leaf surface for 24 hours after application to insure enough is absorbed for leaf spot control.
    v. If tebuconazole is washed from the leaves too quickly, leaf spot control may suffer, though the grower may get maximum control of white mold and limb rot.
    vi. In extremely wet weather, or when the threat from leaf spot diseases is elevated or where resistance has developed, growers should choose to mix 0.75-1.0 pt of chlorothalonil or 5 fl oz Topsin with 7.2 fl oz of tebuconazole to insure leaf spot control. At one time the addition of chlorothalonil was thought to impede the movement of Folicur from the foliage; however this has not found to be a problem. Note: Topsin is added to two alternating applications of tebuconazole in a 4-block program.
    vii. Tank-mixing tebuconazole with the product Prevam has, in some trials, helped to reduce the severity of leaf spot over Folicur applied alone.
    viii. Tebuconazole is applied at a rate of 7.2 fl oz/A, beginning approximately 60 days after planting.

ix. In the most traditional program, tebuconazole is applied in a four-block program, on a 14-day interval.
x. Fewer than four applications of tebuconazole may be sufficient in some low disease situations; however this will be an off-label program.
xi. Improper use of tebuconazole with Stratego, Tilt/Bravo, or Echo-PropiMax could increase the risk of fungal resistance to the sterol-inhibitor fungicides.

i. Management with **Quash** (metconazole)
   i. Quash is a triazole fungicide that is in the same chemical class as tebuconazole.
   ii. Quash is sold by Valent and is used at rates between 2.5 and 4 oz/A.
   iii. Ideally, when Quash is applied at rates of 2.5 to 4 oz/A, a grower should not need to tank-mix additional materials for enhanced leaf spot control. However, where leaf spot resistance to tebuconazole has developed, growers can expect that leaf spot resistance to Quash may also exist. In such cases, it may be important to find a leaf spot tank-mix partner to ensure adequate control when using Quash.
   iv. **Quash** at 2.5 oz/A should be sufficient for control of white mold and Rhizoctonia limb rot under "normal" conditions. Where conditions are favorable for severe outbreaks of white mold, e.g. poor rotation, favorable weather, growers should use the higher rate at 4.0 oz/A.

j. Management with **Provost** (tebuconazole + prothioconazole)
   i. Provost is available to peanut growers in 2010 from Bayer CropScience.
   ii. Based upon results from the University of Georgia, Provost appears to have better systemic activity than other soilborne fungicides. This means that Provost can be more easily translocated within the plant from where it was applied to other regions for greater protection.
   iii. Bayer CropScience recommends that Provost be used in a 4-block program like Folicur.
   iv. The standard rate for Provost is 8.0 fl oz/A; however the rate can be effectively increased to as much as 10.7 fl oz/A when pressure from white mold or limb rot is severe.
   v. Because Provost is a combination of two fungicides within the same chemical class (triazoles/DMI fungicides), it is EXTREMELY important that growers practice good fungicide resistance management principals with this product in order to maintain its efficacy over an extended period of time.
   vi. From University data, Provost has provided excellent control of leaf spot diseases and control of white mold, Rhizoctonia limb rot, and CBR that is at least as good as that of Folicur.

vii. To avoid causing injury to the foliage, growers should carefully read the Provost label before tank-mixing this product with other fungicides.

k. Management with azoxystrobin.
    i. Azoxystrobin is marketed as **Abound** and is typically applied at 60 and 90 days after planting at 18.5 fl oz/A.
    ii. A lower rate (12.0 fl oz/A) is allowed by label in dryland situations or in reduced-risk "Prescription Programs"; however it must be used with caution, as it will not have the "power" of the full rate. We typically do not recommend this rate unless each Abound application is alternated with applications of tebuconazole at 7.2 fl oz/A OR a grower is carefully using a prescription program in a reduced risk field.
    iii. Abound is effective against leaf spot diseases, white mold, and is excellent for management of Rhizoctonia limb rot.
    iv. For maximum efficacy against white mold and limb rot, the field should receive irrigation or rainfall within 72 hours after application.
    v. Fungicide resistance management: To avoid problems with fungicide resistance, Abound should not be used in the same program with Evito, Absolute, Stratego or Headline.
l. Management with fluoxastrobin.
    i. Fluoxastrobin is marketed as **Evito** 480SC.
    ii. Evito is in the same chemical class (strobilurins) as are Headline, Abound, Stratego, and Absolute and should not be used in the same fungicide programs as these products.
    iii. Recommended use for Evito is two applications of product (5.7 fl oz/A) timed approximately 60 and 90 days after planting.
    iv. Evito is an effective component of a peanut disease management program; however it may not be quite as effective against leaf spot and soilborne diseases as are other fungicides.
    v. Evito is NOT "generic Abound".
    vi. Evito T (a combination of Evito and tebuconazole) is also available as a pre-mix from Arysta Lifesciences and should provide good management of peanut diseases.
m. Management with flutolanil.
    i. Flutolanil is an excellent fungicide for the management of white mold and is also effective against Rhizoctonia limb rot. It is not effective against leaf spot diseases.
    ii. Flutolanil is marketed as **Artisan** and **Convoy**.
        1. Convoy, contains only flutolanil and must be mixed with the full-rate of another fungicide for control of leaf spot. Convoy is typically applied at 26 fl oz/A twice (60 and 90 days) or at 13 fl oz/A in a four-block program.

2. Artisan is a combination of flutolanil and propiconazole. Therefore, it will control leaf spot, white mold, and limb rot. Artisan can be applied at a rate or 26 or 32 fl oz/A.
3. Convoy and Artisan are typically applied at 60 and 90 days after planting, though Artisan and Convoy can also be applied in a 4-block program.
4. When using Artisan in a 4-block program, it is applied at rates between 13 and 16 fl oz/A and tank-mixed with an additional leaf spot material, e.g. 1.0 pt chlorothalonil/A or perhaps an alternation of chlorothalonil with Topsin at 5 fl oz/A.
5. As a final note, the flutolanil products Artisan and Convoy have performed **exceptionally well** in field trials where white mold was severe.

n. Management with pyraclostrobin.
   i. Pyraclostrobin is sold as **Headline** (as discussed in the leaf spot section).
   ii. Headline is effective in a soilborne disease management program against white mold and limb rot when applied at the 12-15 fl oz/A rate.
   iii. Headline is not used as a "stand-alone" soilborne fungicide, but rather is used in combination with tebuconazole, or perhaps Artisan or Moncut.
   iv. Headline is not used with Evito, Absolute, Stratego or Abound for fungicide resistance management concerns.
   v. Use of Headline at 12.0 fl oz will provide adequate control of white mold and limb rot when used as a part of a soilborne program and will provide exceptional leaf spot control.
   vi. An ideal use of Headline would be 9 fl oz/A at 40 days after planting, 7.2 fl oz/A Folicur at 60 days after planting, and 12.0 fl oz/A Headline at 74 days after planting.
   vii. Results suggest that growers can greatly improve management of white mold with Headline when it is applied at NIGHT.

o. Management with mixed programs. Some peanut growers in Georgia are experimenting with fungicide programs that mix different fungicides for the control of soilborne diseases and the results can be outstanding. The goal in mixing fungicides is to capture the best control available through the use of multiple chemistries. While some of these programs, like the alternate use of Folicur and Abound, for a total of four soilborne fungicide applications, appear to be quite effective, the grower must accept all responsibility if his program is off-label.

p. **Managing White Mold with Lorsban 15G.** Prior to Folicur, the insecticide Lorsban 15G was one of the only chemicals that growers had to manage white mold. As Folicur and then Abound were labeled,

growers turned away from Lorsban for control of white mold. However, results from field trials in 2003 demonstrate that application of Lorsban 15 G (13.6 lb/A) in conjunction with fungicides may provide control of white mold beyond that of the fungicides alone. It appears that Lorsban 15G may still have a place in white mold control.

Cylindrocladium Black Rot (CBR): CBR is a very challenging disease to control and of increasing importance to growers across the state. Crop rotation away from peanut and soybean is an important management tool. Also, it is important that growers not introduce infested soil from fields where CBR occurs to fields where it is not yet present. This can be done best by cleaning equipment and vehicles before traveling between fields. In recent years, it has been proven that CBR can be transmitted via seed, though at a very low rate. Growers should try to obtain seed produced in fields free of CBR. They should also recognize that much of the seed for Virginia varieties is produced in the Virginia-Carolina region where CBR is of even greater importance than it is in Georgia.

Management points for CBR

1. Crop rotation away from peanut and soybean. Unfortunately, once CBR is established in a field, it is very difficult to eliminate. Not only can the fungal pathogen survive for long periods of time in the soil, but it can also infect common weeds such as beggarweed and coffee weed.
2. **Proline 480SC** (prothioconazole) is a fungicide that is labeled to be applied in-furrow at planting time for management of CBR. The in-furrow rate is 5.7 fl oz/A. The in-furrow application of Proline promises to be a critical component for the management of CBR when followed by foliar application of the effective fungicides noted below. From numerous studies, it is demonstrated that liquid inoculants can be mixed with Proline without loss of efficacy of the fungicide or the inoculant.
    a. Where peanuts are planted in single-row patterns, the Proline is applied at 5.7 fl oz/A beneath the row.
    b. Where peanuts are planted in twin-row patterns, the Proline rate must be split under each row so that the TOTAL rate remains at 5.7 fl oz/A. Where twin rows are planted, the grower can come back an additional 5.7 fl oz/A to the seedlings 14 days after cracking.
3. Provost, Folicur, Abound, and Headline are labeled for the “suppression” of CBR. This means that these fungicides may reduce the symptoms of disease and possibly increase yields above other fungicides. Growers who are battling CBR may choose to use Provost, Folicur, Abound, or Headline for CBR suppression, though results are variable and sometimes disappointing.
4. Varieties with some level of resistance were not available to growers until recently. In the past several years, varieties Georgia-02C, Georgia Greener and Carver, have been released and appear to have at lest some level of resistance to CBR. (Note: Tifguard is no longer recognized as resistant to

CBR.) Growers who have fields where CBR is found may want to consider planting these varieties.

5. It has been found that CBR is more severe in fields where the peanut root-knot nematode also occurs. Therefore, growers who manage nematodes with either Telone II or Temik 15G may find some suppression of CBR as well.
6. Fumigation with metam sodium (e.g. Vapam) at 10 gal/A directly beneath the row 10 days prior to planting is currently our best management strategy for the control of CBR. Results can be quite dramatic and can allow growers to plant peanuts in fields where it would otherwise be nearly impossible to grow a crop.

Prescription Fungicide Programs

"Prescription fungicide programs" are defined as strategies designed to maximize yields and maintain disease control in a field using the appropriate number and type of fungicide applications based upon the risk to disease in the field. The goal of prescription fungicide programs is too use the right amount of fungicide for the level of disease expected in a field and to modify the fungicide use as the risk of disease increases or decreases as the season progresses.

Fields where the risk to disease is high, for example where fields have shorted crop rotation, are planted to less resistant varieties, and weather favors disease development should receive at least seven fungicide applications during the season, and perhaps more.

Fields where the risk to disease is reduced to a low or moderate level, for example where fields have longer rotations and are planted to more resistant varieties, typically do not need the same fungicide program as a higher risk field in order to maximize yields. Research data from many on-farm and small plot studies conducted at the University of Georgia have demonstrated that growers who manage their crop so as to reduce the risk to leaf spot, white mold, and Rhizoctonia limb rot can also reduce the number of fungicide applications and increase the value of their crop by cutting production costs. In low risk fields, it is quite possible to reduce the number of fungicide applications from seven to four, so long as the grower is willing to watch the field to insure that disease does not begin to develop unnoticed.

Growers interested in developing prescription programs should first assess the risk in their field(s) using the PEANUT Rx Disease Risk Index and then contact their local county agent for guidance on a suitable fungicide program. Syngenta Crop Protection, Nichino-America, BASF, Arysta LifeSciences, and Bayer CropScience have developed their on prescription programs with input from University researchers. Growers who use an industry-sponsored prescription program in reduced risk fields can have the confidence that the company will "stand behind" these programs as long as risk level has been appropriately assessed and the appropriate fungicide program has been used.

Managing Seedling Diseases: Seedling diseases were typically not a concern for peanut growers in Georgia prior to the arrival of the tomato spotted wilt virus. Even if some plants were lost in a stand, the neighboring peanut plants were often able to compensate for the loss by growing into the vacated space. However, it is clear that spotted wilt can be devastating when fields have poor stands. For this reason, getting a good stand has become critical for growers. Below are some management techniques to reduce seedling diseases (primarily caused by *Rhizoctonia solani* and *Aspergillus niger*).

1. Rotate peanuts with grass crops to reduce the populations of *Rhizoctonia solani.*
2. Plant the peanut crop when soil temperatures are warm enough to produce rapid, vigorous germination and growth. This can help protect the plants from disease. Excessive moisture at planting will also increase the risk of seedling diseases.
3. Use quality seed that has a good germination rating and will grow vigorously.
4. Choose varieties that are known to germinate and emerge uniformly and with vigor.
5. Use only seed treated with a commercial fungicide seed treatment. The seed treatments that are put on commercial seed prior to purchase are outstanding and provide protection for the seed and seedling. Seed treatments include:
    a. Vitavax PC
    b. Dynasty PD (azoxystrobin + mefenoxam + fludioxonil)
    c. Trilex Optimum (trifloxystrobin + metalaxyl + carboxin)
    d. Trilex Star (trifloxystrobin + metalaxyl + carboxin + thiophanate methyl)
6. Use an in-furrow fungicide where the risk of seedling disease is great or where the grower wants increased insurance of a good stand.
    a. Abound at 6.0 fl oz/A in the furrow at planting can provide increased control of seedling diseases, including Aspergillus crown rot.
    b. Terraclor (64 fl oz/A) also provides additional control of seedling diseases when applied in-furrow.
    c. Growers who are most likely to yield benefits from these in-furrow fungicides are those that have poor crop rotation and a history of seedling disease in the field.

Managing root-knot nematodes: Peanut root-knot nematodes are a severe problem in some fields in Georgia, especially in the sandy soils in the southwest corner of the state. Growers initially become aware of the problem when they note stunted plants across patches in their field. At harvest, many of the pods and pegs from these fields are galled and of poor quality. Based upon conversations with growers, it is likely that many fields across the state have problems with root-knot nematodes, but growers may fail to attribute the cause to nematodes. Below are some management options.

1. Use crop rotation to avoid building large populations of nematodes in a field. Cotton is an excellent rotation crop with peanut to reduce levels of nematodes.
2. Plant the root-knot nematode resistant variety '**Tifguard**'. Use of additional nematicides is NOT needed to protect Tifguard; however it is necessary to use a product such as phorate to protect against thrips injury.
3. **Telone II** at a broadcast rate of 6 gal/A or an in-furrow rate of 4.5 gal/A provides the most consistent and effective control of the root-knot nematodes on peanuts. The following comments are important for the most effective use of Telone II.
    a. Telone II must be applied 7-14 days before planting to avoid damaging the crop.
    b. Growers should ensure that soil conditions are favorable for the effective diffusion of Telone II at the time of fumigation. The seed bed should be carefully prepared and free from large clods of dirt. The soil should be neither too dry nor too wet. The soil should not be wet, but should "clump" together when pressed tightly in one's fist.
    c. Growers should carefully follow all safety precautions when using a fumigant such as Telone II.
    d. Some insecticide, e.g. phorate or Temik 15G, should be applied at planting to ensure adequate control of thrips.
    e. Applications of Temik 15g at 10 lb/A at pegging may still be advisable, even when Telone II was used prior to planting.
4. **Enclosure** (iprodione) is a new product being sold for the management of plant parasitic nematodes on peanut. The parent company of this product, Devgien, continues to invest significant resources in field trials to assess the efficacy of Enclosure on peanuts in our state. Again, as more research results become available, they will be shared with growers, county agents, and consultants.

MINIMIZING DISEASES OF PEANUT IN THE SOUTHEASTERN UNITED STATES

The 2012 Version of the Peanut Disease Risk Index

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Losses to tomato spotted wilt across the peanut production region of the southeastern United States were the lowest recorded since estimates began in 1990. It is estimated that losses associated with spotted wilt were about 0. 5% in 2011. It is believed that growers were able to achieve excellent management of this disease in large part through combined use of Peanut Rx and varieties with improved resistance.

The Spotted Wilt Index and the Peanut Fungal Disease Risk Index were successfully combined in 2005 to produce the Peanut Disease Risk Index for peanut producers in the southeastern United States. The Peanut Disease Risk Index, developed by researchers and Extension specialists at the University of Georgia, the University of Florida, and Auburn University, is now officially known as “PEANUT Rx”. The 2012 version of PEANUT Rx has been fully reviewed and updated by the authors based upon data and observations from the 2011 field season.

There have been a few updates to PEANUT Rx, 2012 from the 2011 version. The changes that have been made can be found in the cultivar/variety and plant population sections of Peanut Rx.

As in the previous versions of the Disease Index, growers will note that attention to variety selection, planting date, plant population, good crop rotation, tillage, and other factors, can have a tremendous impact on the potential for disease in a field.

Spotted Wilt of Peanut

When tomato spotted wilt virus (TSWV) infects a host plant, it can cause a disease that severely weakens or kills that plant. This particular virus is capable of infecting an unusually large number of plant species including several that are important crops in the southeastern United States. In recent years, peanut, tobacco, tomato and pepper crops have been seriously damaged by TSWV. The only known method of TSWV transmission is via certain species of thrips that have previously acquired the virus by feeding on infected plants. The factors leading to the rapid spread of this disease in the Southeast are very complicated and no single treatment or cultural practice has been found to be a consistently effective control measure. However, research continues to identify factors that influence the severity of TSWV in individual peanut fields.

Peanuts and fungal diseases: an unavoidable union

Successful peanut production in the southeastern United States requires that growers use a variety of tactics and strategies to minimize losses to disease. Weather patterns in Georgia and neighboring areas during the growing season, including high temperatures, high humidity and the potential for daily rainfall and thunder storms, create the near-perfect environmental conditions for outbreaks of fungal diseases. Common fungal diseases include early and late leaf spot, rust, Rhizoctonia limb rot, southern stem rot (referred to locally as “white mold”), Cylindrocladium black rot and a host of other diseases that are common, but of sporadic importance. If peanut growers do not take appropriate measures to manage fungal diseases, crop loss in a field may exceed 50%.

Strategies for managing fungal diseases of peanut are typically dependent on the use of multiple fungicide applications during the growing season. Fungicide applications are initiated approximately 30 days after planting, as the interaction between the growth of the crop and environmental conditions are likely to support the development of leaf spot diseases. The length of the effective protective interval of the previous fungicide application determines the timing for subsequent applications. The length of time in which a fungicide can protect the peanut plant from infection is dependent on the properties of the fungicide and on weather conditions. Many growers will begin treating for soilborne diseases approximately 60 days after planting. With attention to proper timing of applications and complete coverage of the peanut canopy, growers can expect good to excellent control of leaf spot and reasonable control of soilborne diseases. Although control of leaf spot may approach 100%, growers typically can only expect about 60-70% control of soilborne diseases with effective fungicide programs.

Weather plays a major role in the potential for disease. Most fungal diseases will be more severe during periods of increased rainfall and of less concern during drier periods. **When weather conditions are very favorable for disease, severe**

epidemics may occur in fields where disease was not thought to be a problem. When weather conditions are unfavorable for fungal growth, disease severity may be low even in fields where it has been common in the past. The AU-pnut leaf spot advisory that has been used to effectively manage diseases in peanut is based on this relationship between disease and weather. Even those growers who do not use AU-pnut recognize the need to shorten the time between fungicide applications in wet weather.

Factors Affecting the Severity of TSWV on Peanut

Peanut Variety

No variety of peanut is immune to TSWV. However, some varieties have consistently demonstrated moderate levels of resistance. In addition to resistance, (reduced disease incidence), some varieties appear to have some degree of tolerance (reduced severity in infected plants) as well. Higher levels of resistance and tolerance are anticipated since peanut breeding programs are now evaluating potential new varieties for response to TSWV.

Peanut varieties can have a major impact on fungal disease. The variety 'Georgia Green' is currently planted on much of the peanut acreage in the Southeast. However, newer varieties from breeding programs at the University of Georgia and the University of Florida not only have improved resistance to spotted wilt, but to fungal diseases as well. For example, the variety 'Georgia-07W' has resistance to white mold that is better than that found in Georgia Green. Variety 'Georgia-02C' has a level of resistance to Cylindrocladium black rot (CBR) that is superior to that of Georgia Green. Just as none of the current varieties is immune to spotted wilt, none are completely immune to fungal diseases either. However, improved resistance will likely lead to reduction in disease severity. It is important to remember that improved resistance to one disease does not mean that the variety also possesses superior resistance to other diseases.

Planting Date

Thrips populations and peanut susceptibility to infection are at their highest in the early spring. The timing of peanut emergence in relation to rapidly changing thrips populations can make a big difference in the incidence of TSWV for the remainder of the season. Optimum planting dates vary from year to year, but in general, early-planted and late-planted peanuts tend to have higher levels of TSWV than peanuts planted in the middle of the planting season. Note: In recent years, peanut planted in the second half of May and in June have been less affected by spotted wilt than in previous years.

It is important for larger acreage peanut farmers to spread their harvest season. Some staggering of planting dates may be necessary, but to avoid spotted wilt pressure, it may be more effective to plant varieties with different time-to-maturity requirements as closely as possible within a low-risk time period. If peanuts must be planted during a high-risk period, try to minimize the risk associated with other index factors.

Planting date can affect the severity of fungal diseases in a field. Earlier planted peanuts (April-early May) tend to have more severe outbreaks of white mold than do later planted peanuts. Earlier planted peanuts are likely to be exposed to longer periods of hot weather, favorable for white mold, than later planted peanuts which will continue to mature into late summer or early fall. However, the threat from leaf spot is generally more severe on peanuts planted later in the season than earlier. Reasons for this include the warmer temperatures later in the season that are more favorable for the growth and spread of the leaf spot pathogens and because the level of inoculum (number of spores) in the environment increases as the season progresses. Thus, later planted peanuts spend a greater portion of their growth exposed to increased leaf spot pressure than do earlier plantings.

Plant Population

An association between skippy stands and higher levels of TSWV was noted soon after the disease began to impact peanut production in Georgia. More recently, research has confirmed the impact of plant population on TSWV incidence. Low and high plant populations may actually have the same number of infected plants, but the percentage of infected plants is greater in low plant populations. In other words, a higher plant population may not reduce the number of infected plants, but it will increase the number of healthy plants that can fill in and compensate for infected plants. In some cases, low plant populations may result in increased numbers of thrips per plant thereby increasing the probability of infection. When plant populations are as low as two plants per foot, severe losses to TSWV have been observed even when other factors would indicate a low level of risk. Getting a rapid, uniform stand with the desired plant population is a function of not only seeding rate but also seed quality, soil moisture, soil temperature and planting depth.

Plant population has less effect on fungal diseases than on spotted wilt. However, it is now known that the severity of white mold increases when the space between the crowns of individual plants decreases. This is because the shorter spacing allows for greater spread of the white mold fungus, *Sclerotium rolfsii*.

Insecticide Usage

In general, the use of insecticides to control thrips vectors has been an ineffective means of suppressing TSWV. In theory, lowering overall thrips populations with insecticides should effectively reduce in-field spread of TSWV. However, insecticides have proven to be ineffective at suppressing primary infection, which accounts for most virus transmission in peanut fields. Despite the overall disappointing results with insecticides, one particular chemical - phorate (Thimet 20G and Phorate 20G), has demonstrated consistent, low-level suppression of TSWV. The mechanism of phorate's TSWV suppression is not known, but the level of thrips control obtained with phorate is <u>not</u> greater than that obtained with other insecticides. Phorate may induce a defense response in the peanut plant that allows the plant to better resist infection or inhibits virus replication.

Row Pattern
Seven to ten-inch twin row spacing, utilizing the same seeding rate per acre as single row spacing, has become increasingly popular in Georgia. Research on irrigated peanuts has shown a strong tendency for significantly higher yields, a one to two point increase in grade and reductions in spotted wilt severity that have averaged 25-30%. The reason for this reduction in spotted wilt is not fully understood.

Row pattern, either single or twin row plantings, also has some effect on the potential for disease in a field. Work done at the Coastal Plain Experiment Station has lead to the observation that white mold is more severe in single rows (six seed per foot) than in twin rows (three seed per foot). White mold often develops in a field by infecting sequential plants within the same row. Planting the seed in twin rows rather than single rows increases the distance between the crowns of the peanut plants and delays the spread of white mold from plant to plant. The difference in leaf spot between single and twin row peanuts appears to be negligible.

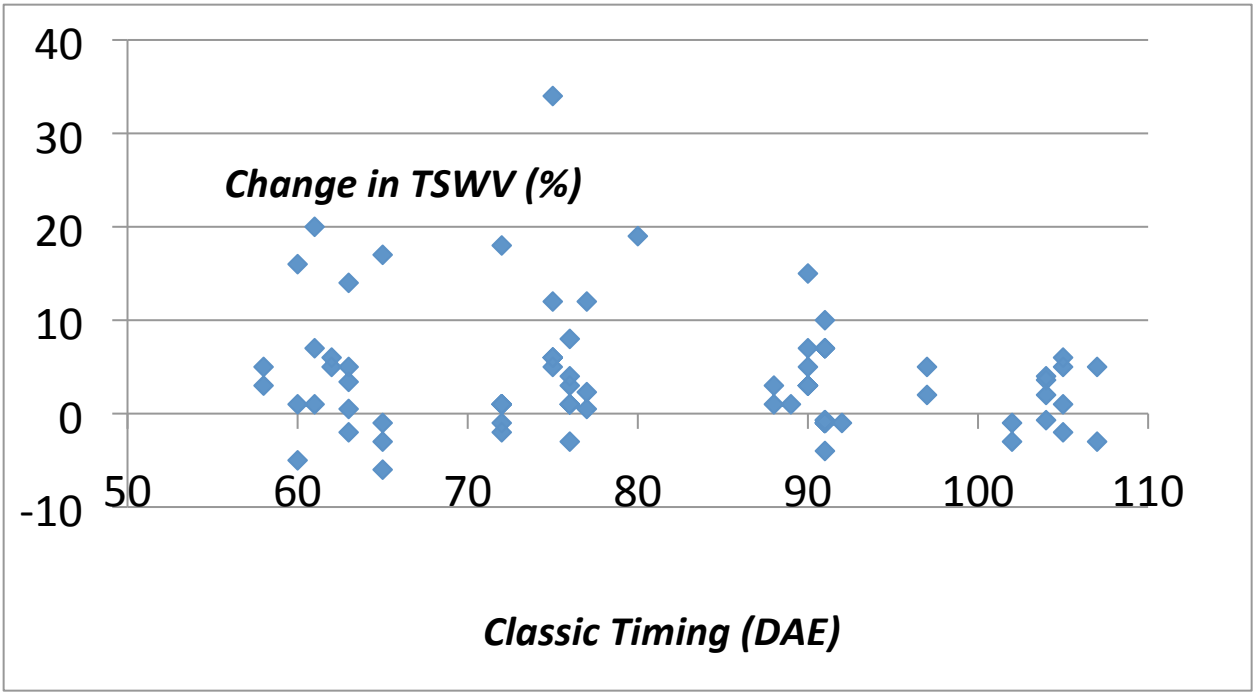
Tillage
The tillage method that a grower utilizes can make a big difference in peanut yields. There are many different methods to choose from, each with its own merits and disadvantages for a given situation. Strip tillage has been shown to have some strong advantages (including reduced soil erosion and reduced time and labor required for planting), but in some situations, yields have been disappointing. Unbiased tillage research is difficult to accomplish, but studies have consistently shown that peanuts grown in strip till systems have less thrips damage and slightly less spotted wilt. On-farm observations have confirmed these results, but more studies are needed in order to characterize the magnitude of the reduction. We do not suggest that growers should change their tillage method just to reduce spotted wilt, but we have included tillage in the risk index in an attempt to better identify total risks.

Conservation tillage, such as strip tillage, can reduce the amount of disease in a peanut field. For a number of years it has been recognized that spotted wilt is less severe in strip-tilled fields than in fields with conventional tillage. However, in results from recent field trials, it has been documented that leaf spot is also less severe in strip-tilled fields than in conventionally tilled fields, so long as peanut is not planted in consecutive season. Although the exact mechanism is currently unknown, the appearance of leaf spot is delayed in strip-tilled fields and the severity at the end of the season is significantly lower than in conventional tillage. Use of conservation tillage does not eliminate the need for fungicides to control leaf spot, but helps to insure added disease control from a fungicide program. Additional studies have found that white mold may be slightly more sever in strip tillage above conventional tillage; deep turning the soil may help to reduce the treat to white mold by burying initial inoculum (sclerotia). Rhizoctonia limb rot was not evaluated; however cotton is a host for *Rhizoctonia solani* and the cotton debris would likely serve as a bridge between crops. Disease management is only one of many factors that a grower must consider when choosing to practice either conventional or conservation tillage. However, if a grower decides to practice conservation tillage with peanut production, he can expect lower levels of leaf spot in many instances.

Classic® Herbicide

Research and field observations over the past several years have confirmed that the use of Classic (chlorimuron) can occasionally result in an increased expression of tomato spotted wilt of peanut. Results from 23 field trials conducted from 2000 to 2011 are presented in the following graph:

Classic Effects on TSWV in Peanut (2000-2011)



Classic caused an 8% or less increase in tomato spotted wilt about 85% of the time and an increase of more than 8% about 15% of the time. Consequently, these results indicate that the effects of Classic on TSWV are minimal in comparison to the other production practices that influence this disease. Consequently, late-season Florida beggarweed populations that have the potential to reduce harvest efficiency and fungicide spray deposition should be treated with Classic. To date, other peanut herbicides have not been shown to have an influence on spotted wilt.

Crop Rotation

Crop rotation is one of the most important tactics to reduce disease severity in peanut production, or any other cropping situation for that matter. Increasing the number of seasons between consecutive peanut crops in the same field has been shown to reduce disease levels and increase yield. The fungal pathogens that cause leaf spot, Rhizoctonia limb rot, and white mold survive between peanut crops on peanut crop debris, as survival structures in the soil, and on volunteer peanuts. The time that passes between consecutive peanut crops allows for the degradation of the peanut crop debris, thus depriving the fungal pathogens of a source of nutrition. Also, fungal

survival structures and spores that are present in the soil have a finite period of viability in which to germinate and infect another peanut plant before they are no longer viable. Fields with longer crop rotations will have less pressure from leaf spot diseases, Rhizoctonia limb rot, white mold, and perhaps CBR, than fields with shorter rotations, or no rotation at all. In Georgia, the Cooperative Extension recommends at least two years between peanut crops to help manage diseases.

Choice of rotation crops, along with the length of the rotation, will have an impact on the potential for disease in a field. Rotation of peanut with ANY other crop will reduce the potential for early leaf spot, late leaf spot, and peanut rust. The pathogens that cause these diseases do not affect other crops. Rotation of peanuts with cotton, or a grass crop such as corn, sorghum, or bahiagrass, will reduce the potential for white mold because the white mold pathogen does not infect these crops, or at least not very well. Rotation of peanut with a grass crop will reduce the risk of Rhizoctonia limb rot. However, because cotton is also infected by *Rhizoctonia solani*, rotation with this crop will not help to reduce Rhizoctonia limb rot. Other crops, such as tobacco and many vegetables are quite susceptible to diseases caused by *Rhizoctonia solani* and will not help to reduce the severity of limb rot in a peanut field.

Special note: Soybean may be a popular crop for some growers in 2012. Growers must remember that soybeans and peanuts are affected by many of the same diseases. Planting soybeans in rotation with peanuts will not reduce the risk for CBR or peanut root-knot nematodes and will have only limited impact of risk to white mold and Rhizoctonia limb rot.

Field History

The history of disease in a field can be an important hint at the possibility of disease in the future, for much the same reason as noted in the crop rotation section above. Fields where growers have had difficulty managing disease in the past, despite the implementation of a good fungicide program, are more likely to have disease problems in the future than are fields with less histories of disease.

There is some difference between white mold and Rhizoctonia limb rot with regards to field history. Where white mold has been a problem in the past, it can be expected to be again in the future. Without effective crop rotation, outbreaks of white mold can be expected to become increasingly severe each season. Rhizoctonia limb rot is a disease that is more sensitive to environmental conditions, especially rainfall and irrigation, than white mold. Therefore, the severity of Rhizoctonia limb rot is likely to be more variable than white mold from year to year based upon the abundance of moisture during the season.

Irrigation

Irrigation is a critical component of a production system and can result in large peanut yields. However, the water applied to a crop with irrigation is also beneficial for the fungal pathogens that cause common diseases such as leaf spot, Rhizoctonia limb rot, and white mold. Rhizoctonia limb rot is likely to be more severe in irrigated fields with

heavy vine growth; the increase in white mold may be less obvious. High soil temperatures as well as moisture from irrigation affect the severity of white mold.

Fungi causing leaf spot diseases need water for several important reasons, including growth, spore germination and infection of the peanut plant, and in some cases, spread of the fungal spores. Use of irrigation may extend the period of leaf wetness and the time of conditions favorable for leaf spot diseases beyond favorable conditions in a non-irrigated field. In two otherwise similar fields, the potential for disease is greater in the irrigated field.

Measuring TSWV Risk

Many factors combine to influence the risk of losses to TSWV in a peanut crop. Some factors are more important than others, but no single factor can be used as a reliable TSWV control measure. However, research data and on-farm observations indicate that when combinations of several factors are considered, an individual field's risk of losses due to TSWV can be estimated. There is no way to predict with total accuracy how much TSWV will occur in a given situation or how the disease will affect yield, but by identifying high risk situations, growers can avoid those production practices that are conducive to major yield losses. The University of Georgia Tomato Spotted Wilt Risk Index for Peanuts was developed as a tool for evaluation of risk associated with individual peanut production situations. When high-risk situations are identified, growers should consider making modifications to their production plan (i.e. variety, planting date, seeding rate, etc.) to reduce their level of risk. **Using preventative measures to reduce risk of TSWV losses is the only way to control the disease. After the crop is planted, there are no known control measures.**

The index combines what is known about individual risk factors into a comprehensive, but simple, estimate of TSWV risk for a given field. It assigns a relative importance to each factor so that an overall level of risk can be estimated. The first version of the index was developed in 1996 and was based on available research data. Small plot studies and on-farm observations have been used to evaluate index performance each year since release of the first version. In research plots where multiple TSWV management practices were used, as little as 5% of the total row feet were severely affected by TSWV compared to over 60% in high-risk situations. Yield differences were over 2000 lbs. per acre in some cases. Results of these and other validation studies have been used to make modifications in all subsequent versions of the index. Future changes are expected as we learn more about TSWV.

Keep in mind that the risk levels assigned by this index are relative. In other words, if this index predicts a low level of risk, we would expect that field to be <u>less likely</u> to suffer major losses due to TSWV than a field that is rated with a higher level of risk. A low index value does <u>not</u> imply that a field is immune from TSWV losses. Losses due to TSWV vary from year to year. In a year where incidence is high statewide, even fields with a low risk level may experience significant losses.

Measuring Risk to Fungal Diseases of Peanut

The index presented here is based upon better understanding of factors that affect disease incidence and severity. It is designed to help growers approximate the magnitude of the risk that they face from foliar and soilborne diseases in the coming season. More importantly, it should serve as an educational tool that allows the grower to predict the benefits of different management practices he makes in hopes of producing a better crop.

The risks associated with leaf spot, white mold and Rhizoctonia limb rot diseases are to be determined independently in the index system to be presented here. The magnitude of points associated with each variable is not linked between soilborne and foliar disease categories. However, the points allotted to each variable in the PEANUT Rx are weighted within a disease category according to the importance of the variable (such as variety or field history) to another variable (such as planting date). For example, within the category for leaf spot diseases, a maximum of 30 points is allotted to the variable “variety” while 0 points is allotted to the variable “row pattern”. The magnitude of points assigned within each category and to each variable has been checked to ensure that the total number of points assigned to a field is consistent with research and experience. For example, while it would be possible for a non-irrigated field planted to Georgia Green to fall in the lowest risk category, a field of irrigated Georgia Green could be in a category of “medium risk” but not “low risk”.

NOTE: When weather conditions are favorable for fungal diseases, especially when rainfall is abundant, even fields at initial “low risk” to fungal diseases may become “high risk”.

PEANUT Rx

For each of the following factors that can influence the incidence of tomato spotted wilt or fungal diseases, the grower or consultant should identify which option best describes the situation for an individual peanut field. An option must be selected for each risk factor unless the information is reported as “unknown”. A score of “0” for any variable does not imply “no risk”, but that this practice does not increase the risk of disease as compared to the alternative. Add the index numbers associated with each choice to obtain an overall risk index value. Compare that number to the risk scale provided and identify the projected level of risk.

Peanut Variety

Variety[1]	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points
			White mold
Flavorunner 458[2] or Florunner	50	unknown	unknown
NC-V 11	35	30	30
AT-215[2]	30	30	30
Georgia Green	30	20	25
Florida Fancy[2]	25	20	20
Georgia-09B[*,2]	20	25	25
FloRun™ '107'[*,2]	20	25	20
Georgia Greener[3]	10	20	20
Georgia-02C[2,3,4]	15	20	10
Georgia-06G	10	20	20
Florida-07[2]	10	20	15
Georgia-07W	10	20	10
Tifguard[6]	10	15	15
Bailey[*,3]	10	15	10
Georganic	5	10	10

**Data for these new varieties is limited and risk ratings will undergo changes as needed in the future.*

[1]*Adequate research data is not available for all varieties with regards to all diseases. Additional varieties will be included as data to support the assignment of an index value are available.*

[2]*High oleic variety.*

[3]*Varieties Georgia-02C,Georgia Greener, and Bailey have increased resistance to Cylindrocladium black rot (CBR) than do other varieties commonly planted in Georgia.*

[4] *The malady referred to as "funky" or "irregular" leaf spot tends to be more severe in Georgia-02C than in other varieties. Although this condition can look like early leaf spot (Cercospora arachidicola), the cause "funky" leaf spot is unknown. Disease losses are not typically associated with funky leaf spot.*

[5]*Tifguard has excellent resistance to the peanut root-knot nematode.*

Planting Date

Peanuts are planted:	Spotted Wilt Points[1]	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
Prior to May 1	30	0	10	0
May 1 to May 10	15	0	5	0
May 11-May 31	5	5	0	0
June 1-June 10	10	10	0	5
After June 10	15	10	0	5

Plant Population (final stand, not seeding rate)

Plant stand:	Spotted Wilt Points[1]	Leaf Spot Points	Soilborne Disease Points	
			White mold[2]	Limb rot
Less than 3 plants/ft	25	NA	0	NA
3 to 4 plants/ft[3]	15	NA	0	NA
3 to 4 plants/ft[4]	10	NA	0	NA
More than 4 plants/ ft	5	NA	5	NA

[1]*Only plant during conditions conducive to rapid, uniform emergence. Less than optimum conditions at planting can result in poor stands or delayed, staggered emergence, both of which can contribute to increased spotted wilt. Note: a twin row is considered to be one row for purposes of determining number of plants per foot of row.*

[2]*It is known that closer planted peanuts tend to have an increased risk to white mold.*

[3]*This category (15 risk points for spotted wilt) is only for varieties with a risk to spotted wilt of MORE THAN 25 points.*

[4]*This category (10 risk points for spotted wilt) is for varieties with 25 point or less for risk to spotted wilt.*

At-Plant Insecticide

Insecticide used:	Spotted Wilt Points*	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
None	15	NA	NA	NA
Other than Thimet 20G or Phorate 20G	15	NA	NA	NA
Thimet 20G, Phorate 20G	5	NA	NA	NA

[*]*An insecticide's influence on the incidence of TSWV is only one factor among many to consider when making an insecticide selection. In a given field, nematode problems may overshadow spotted wilt concerns and decisions should be made accordingly.*

Row Pattern

Peanuts are planted in:	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
Single rows	15	0	5	0
Twin rows	5	0	0	0

Tillage

Tillage	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
conventional	15	10	0	0
reduced*	5	0	5	5

** For fungal diseases, this is does not apply for reduced tillage situations where peanut is following directly behind peanut in a rotation sequence. Limb rot can exist on some types of crop debris and use the organic matter as a bridge to the next peanut crop.*
***"Funky" or "irregular" leaf spot tends to be more severe in conservation tillage than in conventional tillage, though this malady is not typically associated with yield losses.*

Classic® Herbicide

	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
Classic Applied	5	NA	NA	NA
No Classic Applied	0	NA	NA	NA

Crop Rotation with a Non-Legume Crop.

Years Between Peanut Crops*	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
0	NA	25	25	20
1	NA	15	20	15
2	NA	10	10	10
3 or more	NA	5	5	5

**All crops other than peanut are acceptable in a rotation to reduce leaf spot. Cotton and grass crops will reduce the severity of white mold. Rhizoctonia limb rot can still be a significant problem, especially with cotton, under a longer rotation with favorable conditions, e.g. heavy vine growth & irrigation/ rainfall. Rotation with soybeans can increase risk to white mold, Rhizoctonia limb rot, and CBR. Rotation with grass crops will decrease the potential risk of limb rot; tobacco and vegetables will not.*

Note that rotation of peanuts with soybeans may lower the risk for leaf spot diseases, but it does not reduce the risk to CBR or peanut root-knot nematodes and only has minimal impact on risk to white mold or to Rhizoctonia limb rot.

Field History

Previous disease problems in the field?*	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
NO	NA	0	0	0
YES	NA	10	15	10

** "YES" would be appropriate in fields where leaf spot and/or soilborne diseases were a problem in the field despite use of a good fungicide program.*

Irrigation

Does the field receive irrigation?	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
NO	NA	0	0	0
YES	NA	10	5*	10

** Irrigation has a greater affect on Rhizoctonia limb rot than on southern stem rot (white mold) or Cylindrocladium black rot.*

Calculate Your Risk

Add your index values from:

	Spotted Wilt Points	Leaf Spot Points	White Mold Points	Rhizoctonia Limb Rot Points
Peanut Variety				
Planting Date				
Plant Population		----		----
At-Plant Insecticide		----	----	----
Row Pattern				
Tillage				
Classic® Herbicide		----	----	----
Crop Rotation	----			
Field History	----			
Irrigation	----			
Your Total Index Value				

Interpreting Your Risk Total

Point total range for tomato spotted wilt = 35-155.
Point total range for leaf spot = 10-100.
Point total range for white mold = 10-95.
Point total range for Rhizoctonia limb rot = 15-75.

Risk

	Spotted Wilt Points	**Leaf Spot Points**	**Soilborne Points**	
			white mold	**limb rot**
High Risk	**≥115**	**65-100**	**55-80**	**To be detemined**
High Risk for fungal diseases: Growers should always use full fungicide input program in a high-risk situation.				
Medium Risk	**70-110**	**40-60**	**30-50**	**To be determined**
Medium Risk for fungal diseases: Growers can expect better performance from standard fungicide programs. Reduced fungicide programs in research studies have been successfully implemented when conditions are not favorable for disease spread.				
Low Risk	**≤65**	**10-35**	**10-25**	**To be determined**
Low Risk for fungal diseases: These fields are likely to have the least impact from fungal disease. Growers have made the management decisions which offer maximum benefit in reducing the potential for severe disease; these fields are strong candidates for modified disease management programs that require a reduced number of fungicide applications.				

Examples of Disease Risk Assessment

Situation 1.
A grower plants **Georgia Green** (30 spotted wilt points, 20 leaf spot points, 25 white mold points) on **May 5** (15 spotted wilt points, 0 leaf spot points, 5 white mold points, 0 limb rot points), with **two years between peanut crops** (0 spotted wilt points, 10 leaf spot points, 10 white mold points, 10 limb rot points) on **conventional tillage** (15 spotted wilt points, 10 leaf spot points, 0 white mold points, 0 limb rot points), **single row spacing** (15 spotted wilt points, 0 leaf spot points, 5 white mold points, 0 limb rot points), in an **irrigated field** (0 spotted wilt points, 10 leaf spot points, 5 white mold points, 10 limb rot points) with **a history of leaf spot disease**, but **not soilborne diseases** (0 spotted wilt points, 10 leaf spot points, 0 white mold points, 0 limb rot points) using **Classic® herbicide** (5 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points), **Temik 15G at-plant insecticide** (15 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points) with a **final plant population** of 2.8 plants per foot of row (25 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points).

Points:
Spotted wilt: **120** (high risk) leaf spot: **60** (medium risk), white mold: **50** (medium Risk), Rhizoctonia limb rot: **20** (to be determined).

Situation 2.
A grower plants **Georgia-02C** (15 spotted wilt points, 20 leaf spot points, 10 white mold points) on **May 15** (5 spotted wilt points, 5 leaf spot points, 0 white mold points, 0 limb rot points), with **three years between peanut crops** (0 spotted wilt points, 5 leaf spot points, 5 white mold points, 5 Rhizoctonia limb rot points) on **strip tillage** (5 spotted wilt points, 0 leaf spot points, 5 white mold points, 5 limb rot points), **twin row spacing** (5 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points), in an **irrigated field** (0 spotted wilt points, 10 leaf spot points, 5 white mold points, 10 limb rot points) with **no history of leaf spot disease or soilborne disease** (0 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points) with **NO Classic® herbicide** (0 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points), **phorate at-plant insecticide** (5 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points) with a **final plant population** of 4.2 plants per foot (5 spotted wilt points, 0 leaf spot points, 5 white mold points, 0 limb rot points).

Points:
Spotted wilt: **40** (low risk), leaf spot: **40** (medium risk), white mold: **30** (medium risk), Limb rot **20** (to be determined).

Situation 3.
A grower plants **Georgia Green** (30 spotted wilt points, 20 leaf spot points, 25 white mold points) on **May 15** (5 spotted wilt points, 5 leaf spot points, 0 white mold points, 0 limb rot points), with **one year between peanut crops** (0 spotted wilt points, 15 leaf spot points, 20 white mold points, 15 limb rot points) on **conventional tillage** (15 spotted wilt points, 5 leaf spot points, 0 white mold points, 0 limb rot points), **twin row spacing** (5 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points), in an **irrigated field** (0 spotted wilt points, 10 leaf spot points, 5 white mold points, 10 limb rot points) with **a history of leaf spot disease, white mold, but not Rhizoctonia limb rot** (0 spotted wilt points, 10 leaf spot points, 15 white mold points, 0 limb rot points) with **NO Classic® herbicide** (0 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points), **Orthene insecticide** (15 spotted wilt points, 0 leaf spot points, 0 white mold, 0 limb rot points) with a **final plant population** of 3.5 plants per foot of row (15 spotted wilt points, 0 leaf spot points, 0 white mold, 0 limb rot).

Points:
Spotted wilt points: **85** (medium risk), leaf spot risk: **65** (high risk), white mold: **65** (high risk), limb rot: **25** (to be determined))

Situation 4.
A grower plants **Georgia-07W** (10 spotted wilt points, 20 leaf spot points, 10 white mold points) on **April 28** (30 spotted wilt points, 0 leaf spot points, 10 white mold points, 0 limb rot points) with **one year between peanut crops** (0 spotted wilt points, 15 leaf spot points, 20 white mold points, 15 limb rot points) on **strip tillage** (5 spotted wilt points, 0 leaf spot points, 5 white mold points, 5 limb rot points), **twin row spacing** (5 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points) in a **non-irrigated** field (0 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points) with **a history of leaf spot, white mold, and Rhizoctonia limb rot** (0 spotted wilt points, 10 leaf spot points, 15 white mold points, 10 limb rot points), with **NO Classic® herbicide** (0 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points), using **Thimet at-plant insecticide** (5 spotted wilt points, 0 leaf spot points, 0 white mold, 0 limb rot points) with a **final plant population** of 4.4 plants per foot of row (5 spotted wilt points, 0 leaf spot points, 5 white mold, 0 limb rot).

Points:
Spotted wilt risk: **60** (low risk) leaf spot risk: **45** (medium risk), white mold: **60** (high risk), limb rot: **35** (to be determined)

“Planting Windows” to Attain Low Risk for Spotted Wilt

If planting date were the only factor affecting spotted wilt severity, growers would have no flexibility in when they planted. Fortunately, other factors are involved and by choosing other low risk options, growers can expand their planting date window. Remember, the goal is to have a total risk index value of 65 or less, regardless of which combination of production practices works best for you. The following table demonstrates how the planting date window expands as other risk factors go down. For example, where a grower achieves a good stand, uses strip tillage and twin rows, and Thimet, but does not use Classic, he may plant a “10” or “15” point variety at ANY time in the season and still be at “Low” risk for spotted wilt.

	Points assigned to the peanut variety of interest		
	20	15	10
Production practices and final stand	**Planting date options to achieve a “LOW RISK” for Spotted Wilt using above varieties**		
Poor stand, conventional tillage, single rows, Temik, Classic is used	NONE	NONE	NONE
Average stand, twin rows, conventional tillage, Thimet, no use of Classic	May 11-25	May 11-June 5	May 1-June
Good stand, strip tillage, twin rows, Thimet, no use of Classic	After May 1	ANY	ANY

ATTENTION !

Pesticide Precautions

1. Observe all directions, restrictions, and precautions on pesticide labels. It is dangerous, wasteful, and illegal to do otherwise

2. Store all pesticides in original containers with labels intact and behind locked doors. **"KEEP PESTICIDES OUT OF REACH OF CHILDREN."**

3. Use pesticides at correct label dosages and intervals to avoid illegal residues or injury to plants and animals.

4. Apply pesticides carefully to avoid drift or contamination of non-target areas.

5. Surplus pesticides and containers should be disposed of in accordance with label instructions so that contamination of water and other hazards will not result.

6. Follow directions of the pesticide label regarding restrictions as required by State an Federal Laws and Regulations

7. Avoid any actions that may threaten an Endangered Species of its habitat. Your county extension agent can inform you of Endangered Species in your area, help you identify them and through the Fish and Wildlife Office, identify actions that may threaten Endangered Species of their habitat.

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