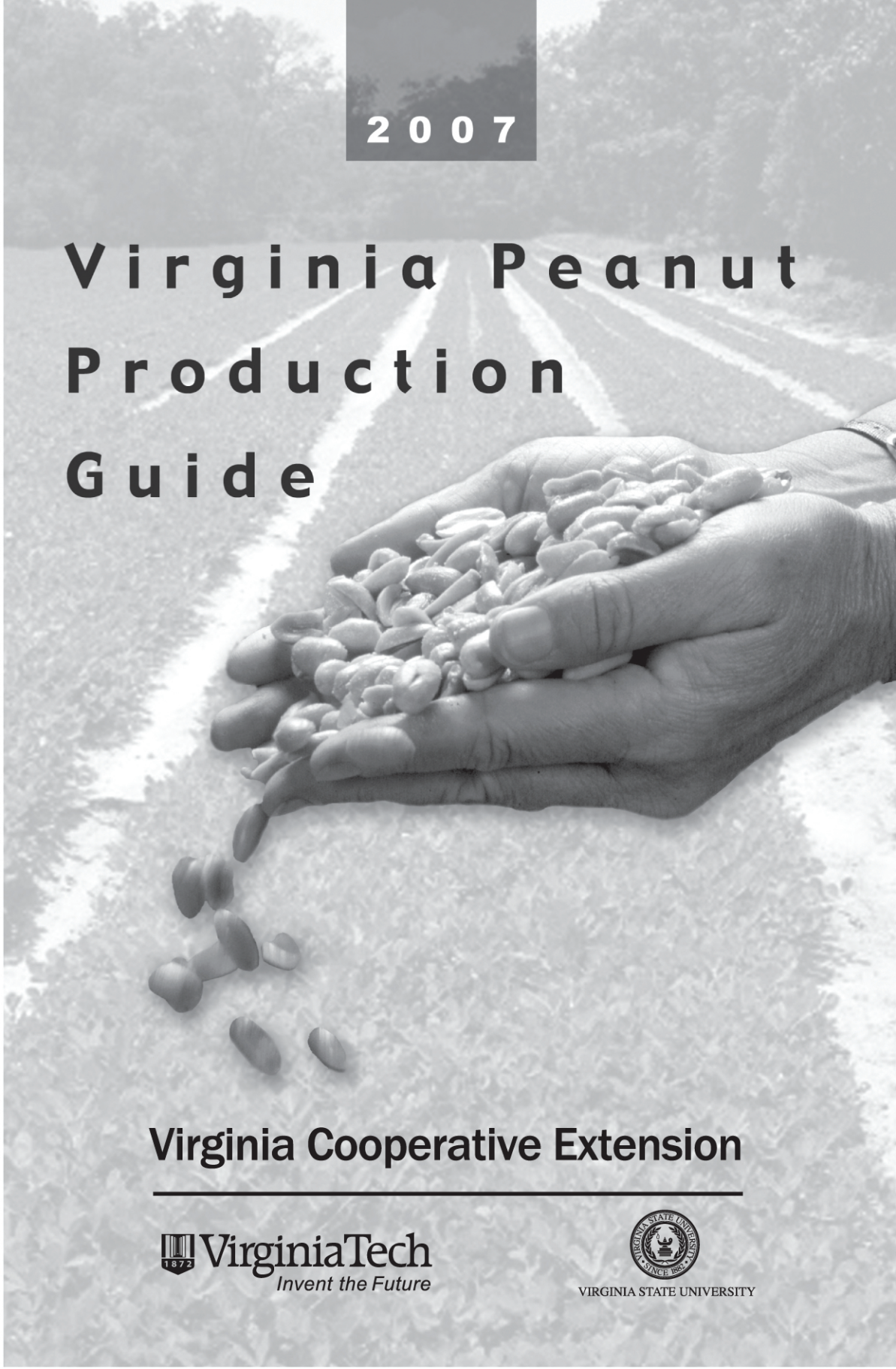
2007

Virginia Peanut Production Guide



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2007

Virginia Peanut Production Guide

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SAFETY FIRST WITH PESTICIDES

Keys to Proper Use of Pesticides

1. Read the label on each pesticide container before each use. Follow the printed instructions to the letter; heed all cautions and warnings; note precautions about residues.

2. Store pesticides in the containers in which you bought them. Put them where children and animals cannot get to them — preferably locked-up and away from food, feed, seed, and other materials that may become harmful if contaminated.

3. Dispose of empty containers in the manner specified on the label.

SEE YOUR DOCTOR IF SYMPTOMS OR ILLNESS OCCURS DURING OR AFTER USE OF PESTICIDES!

IN CASE OF SUSPECTED POISONING

The procedure to be followed is:

1. Call a physician immediately. If the family physician is not available, the patient should be **taken** to the nearest physician or hospital emergency department together with the **container of the poisoning agent**.

2. If necessary, the **physician** will call the nearest poison control center for further information concerning the toxicity of the suspected agent, treatment, and prognosis.

Protective Clothing and Equipment Guide

Use this table as a guide to the selection of protective clothing and equipment. Cross-reference the signal word from the product label and the type of formulation to determine the minimum protection you should wear. This guide is not to be used in place of label statements; refer to the label for specific information.

Table 1. Personal Protective Equipment (PPE) Guide

	Label Signal Word		
Formulation	**Caution**	**Warning**	**Danger**
Dry	Long-leg trousers and long-sleeve shirt; shoes and socks.	Long-leg trousers and long-sleeve shirt; shoes and socks; wide-brim hat; gloves.	Long-leg trousers and long-sleeve shirt; shoes and socks; hat; gloves; cartridge or canister respirator if dusts in air or if label precautionary statement says: **"Poisonous or fatal if inhaled."**
Liquid	Long-leg trousers; long-sleeve shirt; shoes and socks; wide-brim hat.	Long-leg trousers and long-sleeve shirt; shoes and socks; wide-brim hat; rubber gloves. Goggles if required by label precautionary statement. Cartridge or canister respirator if label precautionary statement says: "Do not breathe vapors or spray mists," or "Poisonous if inhaled."	Long-leg trousers and long-sleeve shirt, rubber boots, wide-brim hat, rubber gloves or face shield. Canister respirator if label precautionary statement says: **"Do not breathe vapors or spray mists,"** or **"Poisonous if inhaled."**
Liquid (when mixing)	Long-leg trousers; long-sleeve shirt; shoes and socks; wide-brim hat; gloves; rubber apron.	Long-leg trousers and long-sleeve shirt; shoes and socks; wide-brim hat; rubber gloves; goggles or face shield; rubber apron. Respirator if label precautionary statement says: **"Do not breathe vapors or spray mist."** or **"Poisonous (or fatal or harmful) if inhaled."**	Long-leg trousers and long-sleeve shirt, rubber boots, wide-brim hat, rubber gloves, goggles, rubber apron, canister respirator.

Table 1. Personal Protective Equipment (PPE) Guide (cont.)

Formulation	Label Signal Word		
	Caution	Warning	Danger
Liquid (prolonged exposure to spray, or application in enclosed area).	Long-leg trousers and long-sleeve shirt, boots, rubber gloves, water-proof, wide-brim hat.	Water-repellent, long-leg trousers and long-sleeve shirt, rubber boots, rubber gloves, rubber apron, waterproof, wide-brim hat, face shield, cartridge or canister respirator.	Waterproof suit, rubber boots, rubber gloves, waterproof hood or wide-brim hat, face shield, canister respirator.

Source: *Apply Pesticides Correctly: A Guide for Private and Commercial Applicators.* USDA/USEPA - 1984. p. 102.

Emergency Information

Poison Treatment

In the event of a known or suspected exposure to a toxic (poisonous) substance, one of the Regional Poison Centers listed below should be contacted immediately. These centers provide 24-hour information and consultation services by poison information specialists and board-certified medical toxicologists. If possible, these centers should be called in advance of a person's admission to a local hospital or emergency department so the poison center experts can provide information on the proper treatment. These centers are located in hospitals equipped for all toxicological (poisoning) emergencies.

REGIONAL POISON CENTERS

CHARLOTTESVILLE, VA. Blue Ridge Regional Poison Center Blue Ridge Hospital - Box 67 Medical Center University of Virginia Charlottesville, VA 22901 (804) 924-5543 or (800) 451-1428	**RICHMOND, VA.** Central Virginia Poison Center Virginia Commonwealth University Box 522 - MCV Station Richmond, VA 23298 (800) 552-6337 (VA only) (Calls from Central and Eastern VA only)
WASHINGTON, D.C. National Capital Poison Center Georgetown University Hospital 3201 New Mexico Avenue, NW, Suite 310 Washington, DC 22016 (202) 625-3333 (Call Collect - D.C. and metropolitan area only)	

In addition to the Regional Poison Centers, there are several area hospitals with staff members who will provide some poison information by telephone. These hospitals are equipped for most toxicological emergencies.

GREENSBORO, N.C.
Triad Poison Center
Moses H. Cone Memorial Hospital
1200 North Elm Street
Greensboro, NC 27401-1020
(919) 574-8105
(800) 953-4001 (Calls from Virginia counties on the Va.-N.C. border only, please)

Table 2. Emergency, Spill, Accident, and Incident Information

Incident	Contact	Phone
SPILLS, accidents and other related emergencies	**CHEMTREC** - Chemical Transportation Emergency Center Industry Hotline	(800) 424-9300
SPILLS into water	Virginia Department of Environmental Quality	(804) 527-5194 (8:00 a.m. to 5:00 p.m.) (804) 527-5200 (after 5:00 p.m.)
24-Hour Medical Consultation	National Pesticide Telecommunication Network	(800) 858-7378
FOR ASSISTANCE WITH SPILLS AND EMERGENCIES	Virginia Department of Emergency Services	(804) 674-2400 or (800) 468-8892 (24-hours/day)
ACCIDENTS OR INCIDENTS that constitute a threat to any person, public Field Operations safety and health or the environment	Virginia Department of Agriculture and Consumer Services, Office of Pesticide Management	(804) 371-6560

AGRONOMIC RECOMMENDATIONS AND PROCEDURES

J.C. Faircloth, Peanut/Cotton Specialist, Tidewater AREC

The primary considerations when selecting a peanut variety are yield and quality. Other important characteristics to consider are disease susceptibility, maturity, and stability. The disease susceptibility associated with commercially available Virginia marketplace varieties is reported later in this chapter and in the Peanut Disease chapter. The risks associated with peanut production can be minimized by selecting several varieties ranging in maturity and disease susceptibility characteristics. Variety selection should be based on data from multiple locations and years.

Tables 3 through 6 report percent Fancy pods (% FAN), percent extra large kernels (% ELK), percent sound mature kernels (% SMK), percent total kernels (% TK), and yield from 5 years of testing in Southampton county and City of Suffolk. At each location, tables report data from Dig I (approximately September 15) and Dig II (first week in October). Through examining dig dates, the maturity of a variety relative to the other varieties tested can be assessed. Combining the performance of varieties over years and locations should aid in evaluating the stability associated with a particular variety.

Table 3. Agronomic Performance of Commercially Available Peanut Varieties; Southampton County Location - DIG I - 5-Year Average, 2001-2005*.

Variety	% FAN	% ELK	% SMK	% TK	Yield (lb/acre)
NC-V 11	76	36	68	73	4639
Gregory	90	48	66	71	4719
NC 12C	83	45	68	74	4312
VA 98R	71	35	67	73	4621
Wilson	83	36	65	70	4739
Perry	71	40	67	73	4383
CHAMPS	81	37	70	74	4856
Phillips	81	47	69	74	4637

* *Selected data from: Coker, D.L., Peanut Variety and Quality Evaluation Results. January 2006. Information Series No. 479.*

Table 4. Agronomic Performance of Commercially Available Peanut Varieties; Southampton County Location - DIG II - 5-Year Average, 2001-2005*.

Variety	% FAN	% ELK	% SMK	% TK	Yield (lb/acre)
NC-V 11	73	42	68	74	4790
Gregory	88	55	68	73	4690
NC 12C	83	56	70	76	4742
VA 98R	72	42	68	75	4753
Wilson	79	42	67	72	4688
Perry	72	48	70	76	4724
CHAMPS	79	47	70	76	4675
Phillips	82	55	69	75	5110

* *Selected data from: Coker, D.L., Peanut Variety and Quality Evaluation Results. January 2006. Information Series No. 479.*

Table 5. Agronomic Performance of Commercially Available Peanut Varieties; City of Suffolk Location - DIG I - 5-Year Average, 2001-2005*.

Variety	% FAN	% ELK	% SMK	% TK	Yield (lb/acre)
NC-V 11	81	33	67	71	4977
Gregory	94	47	66	70	5020
NC 12C	88	45	68	72	4557
VA 98R	79	35	68	72	5023
Wilson	84	30	65	68	5117
Perry	81	37	68	72	4522
CHAMPS	86	37	69	72	5231
Phillips	86	42	68	72	5018

* *Selected data from: Coker, D.L., Peanut Variety and Quality Evaluation Results. January 2006. Information Series No. 479.*

Table 6. Agronomic Performance of Commercially Available Peanut Varieties; City of Suffolk Location - DIG II - 5-Year Average, 2001-2005*.

Variety	% FAN	% ELK	% SMK	% TK	Yield (lb/acre)
NC-V 11	80	41	68	73	5375
Gregory	94	57	68	73	5557
NC 12C	88	52	68	74	4841
VA 98R	74	43	69	75	5299
Wilson	81	39	66	71	5493
Perry	77	44	68	74	5180
CHAMPS	83	45	70	74	5218
Phillips	85	54	70	74	5586

* *Selected data from: Coker, D.L., Peanut Variety and Quality Evaluation Results. January 2006. Information Series No. 479.*

Peanut Varietal Descriptions

NC 7

NC 7 has a growth habit intermediate between runner (spreading) and bunch types and is considered to be of medium maturity (145 to 155 days, depending upon growing season). It is partially resistant to early leaf-spot disease and has high yield potential. NC 7 produces a high percentage of ELKs and Fancy pods. NC 7 is very susceptible to CBR (black rot), sclerotinia blight, and TSWV diseases. It does well on both loamy and sandy soils.

NC-V 11

Under good conditions, NC-V 11 has high yield and dollar value per acre. Maturity is about the same as NC 7. NC-V 11 produces fewer fancy pods and a lower percentage of ELKs than NC 7. NC-V 11 has a spreading runner growth habit. It is less susceptible to tomato spotted-wilt virus than other Virginia-type varieties.

NC 12C

NC 12C is a large-seeded CBR-resistant variety. It is similar in maturity, plant type, seed size, shape, seed coat color, and yield to NC 7. NC 12C is very susceptible to sclerotinia blight and TSWV diseases. The pods of NC 12C have a thin hull with a tendency to darken on roasting. Care should be taken to avoid pod damage in combining to minimize price penalty resulting from excessive levels of loose shelled kernels. Under close plant spacing or conditions of high water availability, NC 12C may produce excessive vine growth.

VA-C 92R

VA-C 92R is a high-yielding variety which has a spreading (runner) growth habit. Maturity is 3 to 5 days earlier than NC 7. The SMK percentage of VA-C 92R is equal to NC 7. Pods of VA-C 92R are generally darker in appearance than pods of other varieties. It is susceptible to all of the major diseases of the region.

VA 98R

VA 98R has a runner (spreading) growth habit and high yield potential. Maturity is considered early (5 to 7 days earlier than NC 7). This variety has pod-size, shape, and color which is well suited for in-shell markets. The SMK percentage is equal to NC 7 while ELK percentage is approximately equal to that of VA-C 92R, but lower than NC 7, NC 12C, and Gregory. Fancy pod percentage is approximately equal to NC-V 11, but lower than NC 7, NC 12C, or Gregory. VA 98R is susceptible to the major peanut diseases of the V/C production area.

Gregory

Gregory has a growth habit intermediate between runner (spreading) and bunch types. Maturity is equivalent to NC 7. This variety produces an exceptionally high percentage of ELKs and Fancy pods. Due to large seed size, Gregory has a high soil calcium requirement which may result in reduced seedling vigor if seed is produced under conditions which limit calcium uptake.

Perry

Perry is a high-yielding, large-seeded, CBR-resistant variety. Perry is less susceptible to Sclerotinia blight and web blotch than other Virginia-type varieties, but tends to have

high susceptibility to TSWV. Maturity is approximately 14 days later than that of NC 7. Growth habit is intermediate between runner (spreading) and bunch types. Perry has a pink seed coat and good pod color. Fancy pod and ELK percentage is slightly lower than NC 7.

Wilson

Wilson is a high-yielding, large-seeded Virginia-type peanut variety. This variety has an intermediate (spreading) growth habit. Pod characteristics including shape, size and bright color are ideal for in-shell uses. The fancy pod percentage of Wilson is slightly higher than VA 98R. The extra large kernel percentage of Wilson is lower than NC 7, but equal to NC-V 11. Seed-coat color is pink to light pink. Maturity is 5 to 7 days earlier than NC 7 (approximately equivalent to VA 98R). Wilson is less susceptible to TSWV than NC 7, NC 12C, or Perry, but is more susceptible than NC-V 11 or Gregory. Wilson is susceptible to other peanut diseases common to the V/C production region.

Champs

Champs is a recently introduced, large-seeded Virginia-type peanut with a runner growth habit. Plant height is taller than VA 98R, equal to NC-V 11 and shorter than NC 7 and Wilson. It is expected to be the earliest maturing of available Virginia type varieties, demonstrating optimum yields at early digging (135-140 days after planting in Virginia). Pod brightness is similar to VA 98R and Wilson and fancy pod percentage is higher than VA 98R and NC-V 11 but lower than NC 7. Champs is susceptible to all the major diseases in the V/C region although it is less susceptible to tomato spotted wilt virus than most Virginia-type cultivars being equal to NC-V 11.

Brantley

Brantley is a recently introduced Virginia-type high oleic peanut with growth habit and maturity similar to NC 7. Yield and grade are similar to NC 7 although it has produced a statistically higher content of fancy pods, being similar to Gregory. Extra large kernels content is also higher than NC 7 but less than Gregory. It is susceptible to all the major diseases in the V/C region.

Phillips

Phillips is a recently introduced, large-seeded Virginia-type peanut with an intermediate runner growth habit. Yield in a limited number of trials in Virginia has been high relative to other Virginia-type varieties. Phillips has a higher content of extra large kernels than most Virginia-type peanut varieties. It is susceptible to all the major diseases in the V/C region.

Runner Market Types

For several years, runner market type peanuts have been evaluated for variety performance and disease resistance in Virginia research. In 2006, 15 to 20 percent of the peanut acres in Virginia were planted to Georgia Green runner market type variety. Research in Virginia thus far indicates that this variety has the potential to yield equal to or greater than Virginia-type peanuts and offer more TSWV resistance relative to Virginia market type peanuts. Replicated research data are not available regarding maturity of runner market type peanuts in Virginia although acceptable yields were recorded in 2006 when a below average number of heat units accumulated.

Table 7. Agronomic and Market Characteristics of Virginia Market-type Peanut Varieties Recommended for Virginia

	VARIETY										
Characteristic	**NC 7**	**NC 12C**	**Gregory**	**NC-V 11**	**VA 98R**	**VA-C 92R**	**Perry**	**Wilson**	**Champs**	**Phillips**	**Brantley**
General											
Growth Habit	Int.	Int.	Int.	Runner	Runner	Runner	Int.	Int. – Runner	Runner	Int. – Runner	Int.
Maturity[a]	0	0	0	0	-5 to -7	-3	+14	-5 to 7	-7	-3	0
Pod Retention[b]	0	0	0	+	0	+	0	0	0	0	0
Seed Coat Color	Tan	Tan	Pink	Pink	Pink	Pink	Pink	Pink-Lt. pink	Pink-Lt. pink	Tan	Tan
Soil Type (Adapt.)[c]	M-L	M-L	M-L	M-L	M-L	M-L	M-L	M-L	M-L	M-L	M-L
Seed Count/lb	500	500	450	600	550	550	500	575	475	500	500
Calcium[d]	Low	Low	Low	Mod.	Mod.	High	Mod.	Mod.	High	0	Low
Seed Vigor[b]	0	0	-	+	++	++	0	++	0	0	0
Grade & Quality Factors[b]											
% ELK	0	0	+	-	-	-	-	-	-	0	+
% SMK	0	0	0	0	0	0	0	--	0	0	0
% Fancy	0	0	+	--	--	-	-	+	-	+	0
Blanchability	0	0	0	+	+	+	0	-	0	0	0
Shelf-life	0	0	0	--	- -	-	--	0	-	0	+
Splitting	0	0	0	0	0	0	0			0	0

[a] *0 = Same as NC 7; '+' = Days later than NC 7; '-' = Days earlier than NC 7*

[b] *0 = Same as NC 7; '++' = Substantially higher than NC 7; '--' = Substantially lower than NC 7; - = lower than NC 7; '+' = higher than NC 7*

[c] *Performs best on L = light; M = medium; H = heavy soil type*

[d] *Ability to absorb calcium*

Table 8. Disease and Insect Resistance Characteristics of Virginia Market-Type Peanut Varieties Recommended for Virginia

	VARIETY										
Characteristic	**NC 7**	**NC 12C**	**Gregory**	**NC-V 11**	**VA 98R**	**VA-C 92R**	**Perry**	**Wilson**	**Champs**	**Phillips**	**Brantley**
Disease Resistance[e]											
CBR	VS	MR	S	S	S	S	MR	S	S	S	S
Leaf spot	MR	MR	S	S	S	S	S	S	S	S	S
Pod Rot	S	S	S	S	S	S	S	S	S	S	S
Sclerotinia	VS	VS	VS	S	S	S	MR	S	S	S	S
Stem Rot	S	S	S	S	S	S	S	S	S	S	S
TSW virus	VS	VS	MR	MR	S	S	VS	S	MR	S	S
Web blotch	S	S	S	VS	VS	S	MR	S		S	S
Insect Resistance[e]											
Corn earworm	S	S	S	S	S	S	S	S	S	S	S
Leafhoper	S	S	S	S	S	S	S	S	S	S	S
Rootworm	S	S	S	S	S	S	S	S	S	S	S
Spider mites	S	S	S	S	S	S	S	S	S	S	S
Thrips	S	S	S	S	S	S	S	S	S	S	S

[e] *VS = Very Susceptible; S = Susceptible; MR = Moderately Resistant*

Table 9. Plant Population, Seed Size, and Seeding Rates for Recommended Varieties[1]

Seeding Rates			Variety and Approximate Seed Count Per Pound						
Seed Spacing (inches)	# Seed (per foot)	# Seed (per acre)	Gregory (450)	Phillips Brantley NC 7 NC 12C Perry (500)	VA-C 92R (550)	Wilson VA 98R (575)	NC-V 11 (600)	Champs (475)	Georgia Green (825)
For 36" rows[2]			Lbs seed required to plant 1 acre in 36" rows						
2.0	6	81,120	180	174	160	152	145	167	98
3.0	4	58,080	129	116	106	101	97	123	70
4.0	3	43,560	97	87	80	76	73	92	53
6.0	2	29,040	65	58	53	51	48	62	35

[1] *Seed requirements for one acre at 4 intra-row seed spacings in 36-inch rows*

[2] *For any seed spacing in 32", 34", or 38" rows, multiply the pounds of seed required to plant 36-inch rows as noted below:*

Row spacing	*Multiply lbs for 36" rows by:*
32"	*1.125*
34"	*1.060*
38"	*0.947*

Twin-row Planting Patterns

The impact of twin-row planting has been somewhat inconsistent. Yield increases (5 percent to 10 percent) due to twin-row planting have been documented with the NC-V 11, Perry and VA 98R varieties. Twin-row planting has more consistently resulted in yield increases on light-textured soils (sands to loamy sands) than on medium- to heavy-textured soils (loam to sandy clay loams). Yield increases have been documented in twin-row plantings both with seed spaced 3 to 4 inches apart and with seed spaced 5 to 6 inches apart. Twin-row planting has also been noted to reduce the severity of tomato spotted-wilt virus disease. Good early season weed control is essential when planting in twin rows.

Use of Inoculants

The peanut plant depends upon association with Rhizobium bacteria to form root nodules which "fix" atmospheric nitrogen for use by the plant. Commercial inoculants are available which can be applied to the seed or put into the furrow with the seed at planting. In-furrow inoculants are available as either granular or liquid products. If peanuts are to be planted in a field which has not been planted to peanuts within four to five years, or if the field has not produced a well-nodulated, nitrogen-fixing peanut crop, inoculate the seed at planting or use an in-furrow inoculant.

Trace-element Requirements

Manganese

Manganese is needed in small amounts for peanut production. Soils in the peanut area, until recent years, contained adequate available manganese but now most sandy soils are deficient in this nutrient. Manganese availability to plants most commonly becomes critical with a soil pH of 6.2 to 6.5 or higher. In the heavier and more poorly drained soils, manganese deficiency symptoms (leaf-yellowing) often will occur when soil pH exceeds 6.2. On sandy soils, deficiency symptoms usually will not occur until the soil pH exceeds 6.5. Since peanut yields are not increased by pH values which exceed 6.2, it is recommended that peanut soils retain a pH value of 5.8 to 6.2. Generally, if soil tests indicate less than 3 ppm manganese, one or more foliar applications of the nutrient will be required. Monitor the crop for visual symptoms of manganese deficiency. If deficiency symptoms appear, foliar applications of the nutrient will be required. Soil application of manganese is not recommended. Typical plant deficiency symptoms are yellowing of leaflet tissues between the veins while the veins remain green. Nitrogen deficiency is sometimes confused with manganese deficiency when the whole leaf, including the veins, is pale yellow.

Manganese Recommendations

Apply 1 to 3 applications of manganese [Tecmangam, $MnSO_4$, $MnCl_2$, or $Mn(NO_3)_2$] as a foliar spray as needed between mid-June and August 15 at the rate of 1.0 lb elemental manganese per acre per application. Manganese sources may be tank-mixed with leaf-spot sprays. Cone-type nozzles used for leaf-spot sprays are well suited for application of manganese. If other manganese materials are available, spray the material to deliver 1.0 lb elemental manganese per acre. *Do not mix Solubor with any of these manganese products. Boric acid may be mixed with these manganese products.*

When soil tests for manganese are 3.0 ppm or below, three preventative applications should be made at 2-week intervals, beginning mid-June.

Soil Application - Application of manganese to the soil in fertilizer has been ineffective in providing this element to the crop.

Liquid Manganese Products

A number of liquid formulations containing manganese are available for use on peanuts. When used according to label instructions many of these products provide less than 1.0 lb elemental manganese per acre. Recent Virginia research results have shown that liquid manganese formulations should be applied in multiple applications, which supplies a total of at least 0.5 to 1.0 lb elemental manganese per acre per application. With manganese EDTA chelate the material should supply 0.25 to 0.50 lb elemental manganese per acre per application. EDTA chelated products may be tank mixed with cupric hydroxide and with inorganic sources of boron.

Boron

Boron is needed during kernel development; hence, it should be applied about the time of, or immediately following, flowering. Generally, boron is applied as a wettable powder or liquid spray with the leaf spot fungicides. When plants are under stress or if the recommended rates are exceeded, leaf burning will occur. Excessive use of boron can cause severely reduced yields even when foliage burning is not obvious. Boron can be applied satisfactorily as a soil application in fertilizer. Do not mix solubor with inorganic sources of manganese due to potential compatibility problems.

Boron Recommendation

Apply 0.5 lb elemental boron per acre at the early bloom stage to prevent internal damage. The application of boron is especially important on light sandy soils. The following sources and rates are suggested:

2.5 lb/A Solubor foliar applied in 10-30 gal spray/A

2.8 lb/A Boro-spray foliar applied in 10-30 gal spray/A

2.9 lb/A Boric Acid foliar applied in 10-30 gal spray/A

Apply boron at the time of second or third leaf spot application. Do not apply when plants are under moisture stress. Do not apply with sulfur or other chemicals which tend to burn foliage and do not exceed 0.5 lb/A elemental Boron. Split applications, each of 0.25 lb elemental boron per acre, at 2- to 4-week intervals up to August 15 are suggested.

Do not mix Solubor with Techmangam, $MnS0_4$, $MnCl_2$, $Mn(NO3)_2$, or with leaf-spot disease control products containing cupric hydroxide due to potential compatibility problems.

Landplaster-Calcium Recommendations

Table 10. Landplaster-Calcium Recommendations

Source	% $CaSo_4$	Band (16-18”)	Broadcast
		----------lb/A --------	
US Gypsum Bagged	85		
US Gypsum Bulk 420 (gran.)	83	600	900-1200
US Gypsum Bulk 500 (gran.)	70		900-1200
Texasgulf Gypsum (Phosphogypsum)	50	---	1500-1800
ISG Resources, Inc. Peanut Maker (Semi-Granular)	71	---	1100-1500

Time of application: June 10 - July 15.

Special Recommendation for Peanut Seed Production

It is essential that peanuts being grown for seed receive a continuously available supply of calcium from pegging through seed development to insure high germination. This can be accomplished by either using two (2) applications or by increasing the amount used at the first application by 50 percent; being certain to apply it after June 10. Specific recommendations are:

1. a) June 10 - June 30 — Apply 75 percent of recommended amounts above for non-seed crop.

   b) July 1 - July 20 — Apply 400-500 lb/A of bagged or dry USG 420 or USG 500 landplaster in a band over the row.

OR

2. June 10 - June 30 — Apply the higher rate of the above rate ranges. CAUTION: If soil potash level is relatively low, this choice could cause a potash deficiency to occur unless potash is applied prior to planting.

Recommendations for Runner Market Type Peanut Production

Runner market type peanuts require less calcium (Ca) for optimum seed development than Virginia market types. To assess the need for supplemental Ca, soil samples should be taken up to a 3-inch depth in the pegging zone in mid to late June. If the ratio of calcium to potassium (K) exceeds 3 to 1 and the calcium levels exceed 250 parts per million (ppm), Ca is not recommended. To calculate the ratio of Ca to K, use the following formula:

Ca to K ratio = Ca saturation (%) / K saturation (%)

To calculate the concentration of Ca in ppm use the following equation:

Ca concentration in ppm = Ca saturation (%) x CEC x 200

WEED CONTROL IN PEANUTS

J.C. Faircloth, Extension Peanut/Cotton Specialist

Perennial Broadleaf Weeds: Perennial broadleaf weeds such as horsenettle, trumpetcreeper, maypop passionflower, and bigroot morningglory cannot be effectively controlled in peanuts. Treatment with Blazer plus 2,4-DB will provide some foliage burn and growth suppression of these weeds. Perennial weeds rapidly recover from these treatments. Perennial weeds can be controlled in corn grown in rotation with peanuts. In corn, make a layby application of 1 pt per acre of 2,4-D amine plus surfactant. After corn harvest, spot spray remaining infestations with either glyphosate or a mixture of 2,4-D amine plus 0.5 pt per acre of Banvel plus surfactant. See the product labels for suggested application rates.

Bermudagrass: Two applications of Poast, Poast Plus, or Select will usually provide adequate to good control of bermudagrass in vigorously growing peanuts. See Table 10 for application rates and weed size for treatment. Strive for good control in rotational crops. In soybeans and cotton, Assure II, Fusilade DX, Fusion, Select, Poast, and Poast Plus are registered for postemergence control of bermudagrass.

Broadleaf signalgrass: Sequential herbicide applications are usually necessary to provide adequate control of this annual grass. Apply Prowl, Dual Magnum, or Sonalan as a preplant incorporated treatment and follow with an application of either Lasso or Dual Magnum about the time peanuts emerge. Shallow cultivation and/or a postemergence application of Poast, Poast Plus, or Select may be required in addition to use of soil-applied herbicides. Gramoxone Max or Boa will provide good to excellent control if applied to seedlings with 3 leaves or less.

Texas Panicum: This annual grass is expanding as a problem weed in most peanut-producing counties in Virginia. Lasso, Dual Magnum, Frontier, Outlook and Pursuit will not control Texas panicum. Soil incorporated treatments of Prowl or Sonalan will generally provide good to excellent control. Prowl or Sonalan should be incorporated to a depth of 3 inches (this is deeper than specified on Prowl label). Poast, Poast Plus, or Select provide excellent postemergence control of Texas panicum. Gramoxone Max or Boa will provide good to excellent control if applied to seedlings with 3 leaves or less.

Nutsedge: Both yellow and purple nutsedge occur in Virginia's peanut production area. For either species, sequential herbicide application and/or cultivation may be necessary to obtain satisfactory control. Yellow nutsedge suppression or control can be achieved with soil applications of Pursuit, Strongarm, Frontier, Outlook, or Dual Magnum. Lasso, Frontier, Outlook, or Dual Magnum may be applied as a preemergence or an at-cracking treatment to improve control or suppression of yellow nutsedge. Purple nutsedge suppression can be obtained with a soil application of Pursuit or Strongarm.

If yellow nutsedge escapes soil applied herbicides, Basagran may be applied postemergence to improve control. Apply Basagran when yellow nutsedge is 6 to 8 inches tall. Both yellow and purple nutsedge can be controlled or suppressed with a postemergence application of either Cadre or Pursuit to nutsedge 1 to 3 inches in height.

Prickly sida, ragweed, tropic croton, eclipta, spurred anoda, and velvetleaf: A soil incorporated treatment of Pursuit usually provides good control of prickly sida and spurred anoda, and fair to good control of velvetleaf. Soil applied treatments of Strongarm generally will provide good control of common ragweed and eclipta. No soil applied treatments are available which will satisfactorily control tropic croton.

Basagran, Cadre, or Tough may be used for effective postemergence control of prickly sida. Blazer provides good to excellent control of ragweed and tropic croton. Postemergence application of Blazer at 2 pt per acre will suppress and may control eclipta less than 2 inches tall. (Control not claimed on Blazer label.) Cadre provides good postemergence control of spurred anoda. Refer to product labels for specific details of application information based on weed species and size.

Lambsquarters: Soil-incorporated Strongarm, Sonalan, Pursuit, or Prowl will provide good lambsquarters control. For postemergence control with either Basagran or Blazer, treatments must be applied when lambsquarters seedlings are 2 inches in height or less. Tank mixture of 2,4-DB with Blazer or Basagran improves consistency of lambsquarters control.

Herbicide Injury

Early-season peanut injury may occasionally result from use of soil-applied herbicides. Symptoms of this injury include excessive swelling of the hypocotyl, curling or corkscrew-like growth of the hypocotyl, moderate to severe inhibition (pruning) of root growth, failure of seedlings to emerge or slow seedling emergence, and stunted growth of emerged seedlings. These symptoms may be mimicked or aggravated by weather conditions and low seed vigor or quality. Peanuts usually outgrow this injury with no reduction in yield.

Injury has most commonly been noted with soil-incorporated applications to very sandy soils where the herbicide has not been uniformly mixed with the soil and rainfall has been received or irrigation applied within several days of planting. Preemergence and cracking stage applications are less likely to cause injury than soil-incorporated treatments. Sequential applications of chloroacetamide herbicides (Frontier, Outlook, Dual Magnum, or Lasso) may increase the potential for injury.

Table 11. Recommended Herbicides for Weed Control in Peanuts

Preplant Incorporated			
Weed Problem	**Chemical Rate Per Acre**	**Product Per Acre**	**Remarks**
Crabgrass, goosegrass, fall panicum, johnsongrass, broadleaf signalgrass, Texas panicum, carpetweed, lambsquarters, pigweed	Pendimethalin 0.75-1.0 lb	Prowl 3.3EC 1.8-2.4 pt or Prowl H_2O 1.6-2.1 pt	Incorporate into the top 1 to 2 inches within 7 days of application. Incorporate 3 inches deep for Texas panicum (note this is deeper incorporation than the label specifies). Use higher rate for broadleaf signalgrass, fall panicum, or Texas panicum. May be tank mixed with Dual Magnum, Strongarm, Pursuit, or dimethenamid for control of mixed infestations of nutsedge and annual grasses.
	Ethalfluralin 0.56-0.75 lb	Sonalan 3HFP 1.5-2.0 pt	Incorporate 2 to 3 inches deep within 2 days of application (incorporation as soon as possible after application is preferred). For Texas panicum incorporate 3 inches deep. Use higher rate for fall panicum, Texas panicum, or broadleaf signalgrass. See label for application rates for particular soil. May be tank mixed with Dual Magnum, Pursuit, Strongarm, or dimethenamid for control of mixed infestations of nutsedge and annual grasses.
Broadleaf weeds and suppression of nutsedges	Diclosulam 0.024 lb	Strongarm 84WDG 0.45 oz	Incorporate into the top 3 inches of soil within 4 weeks of planting. When applied in tank mixture with other herbicides, follow incorporation directions for the tank-mix partner. May be tank mixed with Dual Magnum, Prowl, Sonalan, Pursuit, or dimethenamid for improved control of nutsedge and annual grasses.

Table 11. Recommended Herbicides for Weed Control in Peanuts (cont.)

Preplant Incorporated (cont.)			
Weed Problem	**Chemical Rate Per Acre**	**Product Per Acre**	**Remarks**
Crabgrass, fall panicum, goosegrass, broadleaf signalgrass, pigweed, yellow nutsedge	s-Metolachlor 0.95-1.27 lb	Dual Magnum 7.62EC 1.0-1.33 pt or Dual II Magnum 7.64EC 1.0-1.33 pt	Incorporate 2 inches deep within 14 days of planting. Will not control purple nutsedge or adequately control Texas panicum. A sequential application may be used with ½ rate applied PPI and ½ rate applied either preemergence or at cracking. May be tank mixed with Prowl or Sonalan to obtain control of broadleaf signalgrass and Texas panicum.
Crabgrass, fall panicum, goosegrass, broadleaf signalgrass, pigweed, yellow nutsedge.	Dimethenamid 1.17-1.5 lb	Frontier 6E 25.0-32.0 oz or Outlook 6E 6-21 oz	Incorporate 2 inches deep within 14 days of planting. May be applied in a split application with ½ the maximum rate applied PPI and ½ the maximum rate applied as a sequential application. Will not control purple nutsedge or adequately control Texas panicum. May be tank mixed with Prowl or Sonalan for improved broadleaf signalgrass and Texas panicum control.

Table 11. Recommended Herbicides for Weed Control in Peanuts (cont.)

Preplant Incorporated (cont.)			
Weed Problem	**Chemical Rate Per Acre**	**Product Per Acre**	**Remarks**
Controls most annual grasses and broadleaf weeds in conventional and reduced tillage production systems. Control or temporary suppression of many weeds, including hemp dogbane, yellow nutsedge, and rhizome johnsongrass. Provides residual control of large crabgrass, goosegrass, fall panicum, foxtails.	Glyphosate 0.703-0.984 lb ae/A + s-Metolachlor 0.938-1.31 lb ai/A	Sequence 2.5-3.5 pt	Apply to soil surface at planting, but before crop emerges. **Do not incorporate.** Crop injury has been observed, especially when heavy rainfall is received shortly after peanut emergence. Do not exceed 2.5 pt/A of Sequence on medium or fine textured soils. Do not apply to sands or loamy-sand soils. May be useful in no-till peanut and for suppression of yellow nutsedge. **Do not apply Sequence to cracking peanuts.**
Spurred anoda, pigweeds, prickly sida, vealvetleaf, yellow nutsedge, purple nutsedge	Imazethapyr 0.063 lb	Pursuit 70DG 1.44 oz	May be applied and uniformly incorporated 1-2 inches deep prior to planting or applied to soil surface after planting. A sequential application may be used with ½ rate applied PPI and ½ rate applied either at ground crack or early postemergence. Soil incorporated treatments may be tank mixed with Prowl, dimethenamid, Sonalan, Lasso, or Dual Magnum. Do not apply more than 1.44 oz 70DG/A/season.

Table 11. Recommended Herbicides for Weed Control in Peanuts (cont.)

Preemergence			
Weed Problem	**Chemical Rate per Acre**	**Product Per Acre**	**Remarks**
Yellow and purple nutsedges, many broadleaf weeds	Imazethapyr 0.063 lb	Pursuit 70DG 1.44 oz	Apply after planting and preferably before emergence of weeds. May be tank mixed with Dual Magnum, dimethenamid, or Lasso. Preemergence application of Pursuit has been less consistent in weed control than either soil incorporated or split (PPI + PRE) application.
Broadleaf weeds and suppression of nutsedges	Diclosulam 0.024 lb	Strongarm 84WDG 0.45 oz	Apply after planting but prior to crop or weed emergence. May be tank mixed with other herbicides registered for preemergence application.
Barnyardgrass, broadleaf signalgrass, crabgrass, fall panicum, goosegrass, pigweed, carpetweed	Alachlor 3.0-4.0 lb	Lasso 4EC 3.0-4.0 qt or Lasso II 15G 20-26 lb Micro-Tech 4ME 3.0 q or Partner 65 WDG 4.5 lb	Apply to the soil surface before weeds or crop emerge. Good annual grass control except for Texas panicum.
Crabgrass, fall panicum, goosegrass, broadleaf signalgrass, pigweed, yellow nutsedge	s-Metolachlor 0.95-1.27 lb	Dual Magnum 7.62EC 1.0-1.33 pt or Dual II Magnum 7.64EC 1.0-1.33 pt or Dual IIG Magnum 6.0-8.0 lb	Apply to the soil surface before weeds or crop emerge. Good annual grass control except for Texas panicum. Do not use Dual II Magnum, or Dual II G after peanuts have emerged.
Crabgrass, fall panicum, goosegrass, broadleaf signalgrass, pigweed, yellow nutsedge	Dimethenamid 1.2-1.5 lb	Frontier 6E 25.0-32.0 oz or Outllook 6E 16.0-21.0 oz	Apply to soil surface before weeds or crop emerge. Good annual grass control except for Texas panicum.

Table 11. Recommended Herbicides for Weed Control in Peanuts (cont.)

Weed Problem	Chemical Rate per Acre	Product Per Acre	Remarks
Preemergence			
Broadleaf weeds	Flumioixazin 0.063 oz	Valor SX 2.0 oz	Apply within 2 days following planting. Significant injury has been observed if applied 3 or more days after planting. Do not incorporate. Will not control nutsedge (purple or yellow) or sicklepod. Effective on ragweed, sicklepod, eclipta, and pigweed. Follow labeled sprayer cleanout instructions. Spray equipment used to apply Valor SX should not be used to apply other material to crop foliage. If heavy rain occurs at emergence, foliar injury from splashing Valor can occur. Peanut typically recovers by mid season.
Ground Cracking			
Small annual grasses, broadleaf weeds	Paraquat 0.125 lb	Gramoxone Inteon 8.0 oz or Boa 2.5SC 6.6 fl oz	Effective only on small, emerged weeds (less than 1 inch tall). Does not provide residual control. Add 1.0 pt of nonionic surfactant/100 gal spray solution. Will cause foliar burn on emerged peanuts but crop recovers and yield is not affected. May be tank mixed with Basagran or 2,4-DB to broaden the spectrum of broadleaf weeds controlled. May be tank mixed with Dual Magnum, Outlook, or Pursuit to obtain residual weed control. Do not apply later than 28 days after ground cracking.
	Paraquat 0.125 lb + 2,4-DB 0.125-0.25 lb	Gramoxone Inteon 8.0 oz + Butyrac 2SC 0.5-1.0 pt or Butoxone 1.75SC 0.5-1.0 pt	See comments for paraquat alone. Adding 2,4-DB improves morningglory and cocklebur control. Do not apply later than 28 days after ground cracking. Add 1.0 pt of nonionic surfactant/100 gal spray solution.

Table 11. Recommended Herbicides for Weed Control in Peanuts (cont.)

Weed Problem	Chemical Rate Per Acre	Product Per Acre	Remarks
Ground Cracking (cont.)			
Small annual grasses, broadleaf weeds	Paraquat 0.125 lb + Bentazon 0.5 lb	Gramoxone Inteon 8.0 oz + Basagran 4SC 1.0 pt	See comments for paraquat alone. Adding Basagran improves control of prickly sida, common ragweed, common lambsquarters, smartweed, spurred anoda, and cocklebur and reduces peanut injury. Do not apply later than 28 days after cracking. Add 1.0 pt of nonionic surfactant/100 gal of spray solution.
Barnyardgrass, broadleaf signalgrass, crabgrass, fall panicum, goosegrass, pigweed, carpetweed	Alachlor 2.0-3.0 lb	Lasso 4EC 2.0-3.0 qt or Micro-Tech 4ME 3.0 qt or Partner 65WDG 4.5 lb	Good annual grass control except Texas panicum. Use as a supplement to preplant-incorporated or preemergence treatments to provide additional residual control of annual grasses and small-seeded broadleaf weeds. Will not control emerged weeds.
Postemergence			
Mainly cocklebur, annual morningglory (except pitted morningglory), sicklepod **(See Tables 14 and 15)**	2,4-DB 0.2-0.25 lb	Butoxone 1.75SC 0.9-1.1 pt or Butyrac 2SC 0.8-1.0 pt	Use when weeds are in the seedling stage and actively growing. Apply with 10 to 30 gal/A spray volume and 20 to 40 psi spray pressure. Cocklebur and morningglory are most susceptible. Ragweed, lambsquarters, jimsonweed, pigweed, and teaweed (prickly sida) are rather tolerant and may only be suppressed. The higher rate should be used if the difficult-to-control species are present. Do not graze or feed treated forage to livestock. May be applied from 2 weeks after planting to within 45 days of harvest. Avoid drift to other crops.

Table 11. Recommended Herbicides for Weed Control in Peanuts (cont.)

Postemergence			
Weed Problem	**Chemical Rate Per Acre**	**Product Per Acre**	**Remarks**
Broad-spectrum broadleaf weed control **(See Tables 14 and 15)**	Bentazon 0.5 lb + Acifluorfen 0.25 lb	Storm 4EC 1.5 pt (premix)	Apply to small, actively growing weeds with a minimum of 20 gal/A spray volume and 40 psi. Apply with 1 to 2 pt/A crop-oil concentrate or 1.0 pt of nonionic surfactant/100 gal spray solution. See label for weeds controlled. May be tank mixed with 0.5 to 1.0 pt/A 2,4-DB for improved control of certain broadleaf weeds.
Same as for bentazon alone; however, the addition of acifluorfen improves control of pigweeds, morningglories and common ragweed. **(See Table 15)**	Bentazon 0.75-1.0 lb + Acifluorfen 0.25-.0.5 lb	Basagran 4SC 1.5-2.0 pt + Ultra Blazer 2L 1.0-2.0 pt (tank mix)	Apply to small, actively growing weeds. Use spray pressures of 40 to 60 psi. Do not use large-orifice nozzles. Apply with 1.0 pt nonionic surfactant/100 gal spray solution or a crop-oil concentrate at 1.0 to 2.0 pt/A. Increased leaf burn and weed control is usually observed with use of crop oil and higher rates of Blazer. Do not apply within 75 days of harvest.
Cocklebur, jimsonweed, smartweed, prickly sida (teaweed), spurred anoda, wild mustard, yellow nutsedge **(See Table 15)**	Bentazon 0.5-1.0 lb	Basagran 4SC 1.0-2.0 pt	Apply when broadleaf weeds are small and actively growing. Apply with 1.0 to 2.0 pt/A crop-oil concentrate. Peanuts are tolerant at any growth stage. Use minimum of 10 gal/A spray volume at 40 to 50 psi. Split applications 7 to 10 days apart, applying 1.5 to 2.0 pt each usually improves control of morningglory and spurred anoda. Do not apply more than 4.0 pt/A/ season.
Same as for bentazon alone, however, the addition of 2,4-DB improves control of morningglories and spurred anoda.	Bentazon 0.75-1.0 lb + 2,4-DB 0.12 lb	Basagran 4SC 1.0-2.0 pt + Butyrac 2SC 8.0 fl oz or Butoxone 1.75SC 9 fl oz	Apply in a minimum of 20 gal/A spray volume and 40 psi. Apply to actively growing small weeds. Avoid drift to other crops. Label directions prohibit addition of oil concentrate or other additives. Do not apply within 45 days of harvest or make more than 2 applications/year.

Table 11. Recommended Herbicides for Weed Control in Peanuts (cont.)

Postemergence (cont.)			
Weed Problem	**Chemical Rate Per Acre**	**Product Per Acre**	**Remarks**
Cocklebur, eastern black nightshade, ragweed, eclipta, jimsonweed, morningglory, and pigweed	Lactofen 0.2 lb	Cobra 2 EC 12.5 fl oz	Apply to actively growing weeds after peanut reaches the 6 true leaf stage. Do not apply sequential application within 14 days of the first. Add nonionic surfactant at 1 qt. per 100 gallons or petroleum or vegetable based crop oil concentrate at 1-1.5 pt. per acre. See label for adjuvant use. Do not apply within 90 days of harvest. May be tank mixed with Butyrac and/or Butoxone to enhance spectrum of weeds controlled. In tank mixes, use use nonionic surfactants, not crop oil.
Common ragweed, jimsonweed, morningglory, pigweed, carpetweed, purslane, cocklebur, tropic croton, lambsquarters, eastern black nightshade, smartweed, spotted and prostrate spurge, wild mustard **(See Table 15)**	Acifluorfen 0.25-0.5 lb	Ultra Blazer 2L 1.0-2.0 pt	Apply when broadleaf weeds are small and actively growing. Refer to label for proper growth stage of weed. Good coverage by spray solution is important. Follow label directions concerning best application procedures and rates for different weed sizes to be controlled. Use a minimum of 25 to 40 gal/A, and spray pressures of 40 to 60 psi. Do not use flood tips. Add 2.0 pt/A crop-oil concentrate or 1.0 pt nonionic surfactant/100 gal of spray solution. Do not apply more than 2.0 pt/A of Ultra Blazer postemergence/season. Do not apply within 75 days of harvest.
Morningglory, cocklebur, common ragweed, tropic croton, redroot pigweed	Acifluorfen 0.25-0.5 lb + 2,4-DB 0.2-0.25 lb	Ultra Blazer 2L 1.0-2.0 pt + Butyrac 2SC 1.0 pt or Butoxone 1.75SC 1.0 pt	See comments about Blazer applied alone. Tank mix provides improved control of large morningglory, cocklebur, and certain other broadleaf weeds when size exceeds that specified on Ultra Blazer label. See label for spray additive use. Apply when peanuts are at least 2 weeks old and before pod filling begins. Make only 1 application/year. Do not apply within 75 days of harvest. Avoid drift to other crops.

Table 11. Recommended Herbicides for Weed Control in Peanuts (cont.)

Postemergence (cont.)			
Weed Problem	**Chemical Rate Per Acre**	**Product Per Acre**	**Remarks**
Morningglories, pigweeds, velvetleaf, yellow nutsedge, purple nutsedge	Imazethapyr 0.063 lb	Pursuit 70DG 1.44 oz	Apply from ground crack to early postemergence when weeds are actively growing and are less than 3 inches tall. Certain weeds such as common lambsquarters, prickly sida, and velvetleaf should be treated less than 2 inches in height. Apply with a nonionic surfactant (1.0 qt/100 gal spray volume) or crop-oil concentrate (1.0 qt/A). Do not apply more than 0.063 lb ai A/ season. Do not apply within 85 days of harvest.
Spurred anoda, morningglories, pigweeds, velvetleaf, yellow and purple nutsedge, sicklepod	Imazapic 0.063 lb	Cadre 70DG 1.44 oz	Apply when broadleaf weeds are actively growing and are less than 3 inches tall. Certain weeds such as common lambsquarters, prickly sida, velvetleaf, and spurred anoda should be treated when 2 inches tall or less. Apply with 1.0 qt/A crop-oil concentrate or 1.0 qt nonionic surfactant/100 gal spray solution. Apply as a sequential treatment following application of a soil-applied grass control herbicide.
Annual grasses **(See Table 13)**	Clethodim 0.094-0.125 lb + crop-oil concentrate	Select 2EC 6.0-8.0 oz + COC 2.0 pt	Apply to actively growing grasses. In general, annual grasses should be 2 to 4 inches tall for best results. Do not apply within 40 days of harvest. See labels for tank-mix instructions.
	Sethoxydim 0.19 lb + crop-oil concentrate or Dash	Poast 1.5EC 1.0 pt or Poast Plus 1EC 1.5 pt + COC 2.0 pt or Dash 2.0 pt	

Table 11. Recommended Herbicides for Weed Control in Peanuts (cont.)

Postemergence (cont.)			
Weed Problem	**Chemical Rate Per Acre**	**Product Per Acre**	**Remarks**
Bermudagrass **(See Table 14)**	Clethodim 0.125-0.25 lb + crop-oil concentrate	Select 2EC 8.0-16.0 oz + COC 2.0 pt	Apply to actively growing bermudagrass when stolons (runners) are 3 to 6 inches in length. If needed, a second application of 8.0 to 16.0 oz/A may be applied for control of regrowth when stolons are 3 to 6 inches in length.
	Sethoxydim 0.28 lb + crop-oil concentrate or Dash	Poast 1.5EC 1.5 pt or Poast Plus 1EC 2.25 pt + COC 2.0 pt or Dash 2.0 pt	Apply to actively growing bermudagrass before plant stolon (runner) length exceeds 6 inches. A second application of 1.0 pt/A Poast or 1.5 pt/A Poast Plus is usually necessary for good control. Make the second application when stolon regrowth is 1 to 4 inches in length.
Rhizome Johnsongrass **(See Table 14)**	Clethodim 0.125-0.25 lb + crop-oil concentrate	Select 2EC 8.0-16.0 oz + COC 2.0 pt	Apply to actively growing johnsongrass when 12 to 24 inches tall. If needed, a second application of 6.0 to 8.0 oz/A may be applied for control of regrowth when plants are 6 to 18 inches tall.
	Sethoxydim 0.28 lb + crop-oil concentrate or Dash	Poast 1.5EC 1.5 pt or Poast Plus 1EC 2.25 pt + COC 2.0 pt or Dash 2.0 pt	Apply to actively growing johnsongrass when 15 to 25 inches tall. A second application of 1.0 pt/A Poast or 1.5 pt/A Poast Plus may be made when new plants or regrowth are 6 to 12 inches tall.

Table 11. Recommended Herbicides for Weed Control in Peanuts (cont.)

Postemergence (cont.)			
Weed Problem	**Chemical Rate Per Acre**	**Product Per Acre**	**Remarks**
Extended late-season residual grass control	s-Metolachlor 0.95-1.27 lb	Dual Magnum 7.62EC 1.0-1.33 pt	Apply over-the-top of peanuts for control of late-season grasses in years when excessive rains may have reduced the residual control of early-season applications. Will not control emerged grasses. Do not apply within 90 days of harvest. Do not apply more than an equivalent of 2.67 lb ai/A s-metolachlor during any one year. Dual IIG Magnum and Dual II Magnum are not registered for this method of application in peanut.
	Dimethenamid 1.17-1.5 lb	Frontier 6E 25-32 oz or Outlook 6E 16-21 oz	Apply over-the-top of peanuts for control of late season grasses in years when excessive rains may have reduced residual control of early-season applications. Will not control emerged grasses. Do not apply within 80 days of harvest or more than 32 oz/A per season.

Table 12. Weed Species Response to Herbicides for Peanuts[1]

	Soil-applied Herbicides[2]									
Species	Sonalan PPI[2]	Prowl PPI[2]	Lasso PPI/PRE[2]	Dual PPI/PRE[2]	Frontier/Outlook PPI/PRE[2]	Strongarm PPI/PRE[2]	Pursuit PPI[2]	Pursuit PRE[2]	Sequence PRE[2]	Valor PRE[2]
Texas panicum	G-E	G-E	P	P	P-F	P	P-F	P-F	P	PF
Barnyardgrass	G-E	G-E	E	G	G	P	G	G	F-G	PF
Crabgrass	E	E	E	E	E	P	F	P-F	F-G	PF
Goosegrass	E	E	E	E	E	P	P	P	F-G	F
Fall panicum	G-E	G-E	G	G	G-E	P	P-F	P-F	F-G	PF
Signalgrass, broadleaf	G-E	G	G	G	G	P	G	G	P-F	P
Foxtails	E	E	E	G	G	P	F-G	F-G	F-G	PF
Nutsedge, yellow	N	N	F	G	F-G	F-G	F-G	F-G	P-F	P
Nutsedge, purple	N	N	P	P	P	F-G	F-G	P	P-F	P
Cocklebur	N	N	P	P	P	G	G	G	N	PF
Jimsonweed	P	P	P	P	P	G-E	G	G	N	G
Lambsquarters, common	G	G	F	F	P	F-G	G	F-G	P	GE
Morningglory	P	P	P	P	P	G	F-G	F-G	N	GE
Pigweed, common	G	G	E	G-E	G-E	N	E	E	F-G	E
Prickly sida (teaweed)	P	P	P	P	P-F	F-G	G	G	N	FG
Ragweed	P	P	P	P	P-F	G-E	P	P	P	GE
Smartweed	P	P	P	P	P-F	G	G	G	P	-
Eclipta	P	P	P	P	P	G-E	P	P	G	G
Carpetweed	G	G	F-G	F	F-G	G	F-G	F-G	E	F
Sicklepod	P	P	P	P	P	N	P	P	N	P
Spurred anoda (cottonweed)	P	P	P	P	P	F-G	G	G	G	F
Velvetleaf	P	P	P	P	P	G-E	F-G	F-G	P	F
Tropic croton	P	P	P	P	P	F	P	P	F	-

[1] *Control Capabilities:*
E = Excellent Control; 90% or better
G = Good Control; 80-90%
F = Fair Control; 60-80%
N = less than 20%
P = Poor Control; 20-60%

[2] *Application Method:*
PPI = Pre-plant soil incorporated
PRE = Pre-emergence

Table 12. Weed Species Response to Herbicides for Peanuts (cont.)[1]

	Postemergence Herbicides[2]										
				Paraquat +							
Species	Pursuit AC/EPOE	Paraquat AC	2,4-DB POE	2,4-DB AC	Basagran AC	Basagran POE	Blazer POE	Cadre[3] POE	Storm POE	Select or Poast POE	Cobra POF
Texas panicum	P-F	E	N	G-E	F	N	P	G-E	N	E	N
Barnyardgrass	G	G	P	G	P-F	N	P	G-E	N	E	N
Crabgrass	P-F	G	P	G	P-F	N	P	G-E	N	E	N
Goosegrass	P	E	P	G-E	P-F	N	P	G-E	N	E	N
Fall panicum	P-F	E	P	F-G	P-F	N	P	G-E	N	G	N
Signalgrass, broadleaf	G	E	P	G-E	P-F	N	P	G-E	N	E	N
Foxtails	G	E	P	G-E	P-F	N	P	G-E	N	E	N
Nutsedge, yellow	F-G	P-F	P	F	F-G	G	P	G-E	F	N	N
Nutsedge, purple	F-G	P	N	N	N	N	N	G-E	N	N	N
Cocklebur	G	E	E	E	E	E	G	G-E	E	N	G
Jimsonweed	G	E	F	G	E	E	E	F-G	E	N	E
Lambsquarters, common	P	F	G	F-G	F-G	G	G	P-F	G	N	P
Morningglory	F-G	F	E	G-F	F	F-G	G-E	G-E	G	N	G
Pigweed, common	E	E	G	G	G	P-F	E	E	G	N	E

Table 12. Weed Species Response to Herbicides for Peanuts (cont.)[1]

	Postemergence Herbicides[2] (cont.)										
	Paraquat +									Select or Poast	
Species	Pursuit AC/EPOE	Paraquat AC	2,4-DB POE	2,4-DB AC	Basagran AC	Basagran POE	Blazer POE	Cadre[3] POE	Storm POE	POE	Cobra POE
Prickly sida (teaweed)	P	P-F	F	P	G	G	P	G	F-G	N	G
Ragweed	P	F	F-G	F	G	F-G	G	P-F	G	N	E
Smartweed	G	G	F	G	G	E	G	G-G	E	N	F
Eclipta	P	F-G	P	P	F	P	G	F	G-E	N	G
Carpetweed	F-G	F-G	F	F-G	P	P	G	G	G	N	G
Sicklepod	P	G[4]	G[4]	G[4]	G[4]	N	P	E	P	N	P
Spurred anoda (cottonweed)	F-G	P	P	P	G	G	P	G	F	N	F
Velvetleaf	F-G	F	P	F	G	G	P-F	G-E	F-G	N	G
Tropic croton	P	F	P-F	F	F	P	G-E	P	G-E	N	G

[1] *Response expressed as activity on emerged seedlings in early stages of development at relatively low rates. Control is erratic or poor on weeds if they are larger.*

E = Excellent control; 90% or better *F = Fair control; 60-80%* *P = Poor control; 20-60%*
G = Good control; 80-90% *N = None; less than 20%*

[2] *Application Method:*

POE = Postemergence *EPOE = Early postemergence* *AC = At cracking*

[3] *Cadre provides G-E control of emerged annual grasses which escape soil-applied grass control herbicides.*

[4] *Rating assumes sequential application of 2,4-DB 10 to 14 days after initial treatment.*

Table 13. Recommended Weed Sizes for Treatment and Application Rates for Control of Annual Grasses

	Application Rates and Annual Grass Size					
	Poast[1]		Poast Plus[1]		Select[2]	
Species	Height (in)	Rate (oz/A)	Height (in)	Rate (oz/A)	Height (in)	Rate (oz/A)
Broadleaf signalgrass	8	16	8	24	2-6	6-8
Crabgrass	6	16	6	24	2-6	6-8
Fall panicum	8	16	8	24	2-8	6-8
Giant foxtail	8	16	8	24	2-12	6-8
Green foxtail	8	16	8	24	2-8	6-8
Yellow foxtail	8	16	8	24	2-8	6-8
Goosegrass	6	16	6	24	2-6	6-8
Seedling johnsongrass	8	16	8	24	4-10	6-8
Texas panicum	8	16	8	24	2-6	6-8
Volunteer corn	20	16	20	24	4-12 12-24	4-6 6-8

[1] *Apply with 2.0 pt/A crop-oil concentrate.*

[2] *Apply Select with 1% v/v crop-oil concentrate.*

Table 14. Plant Size and Application Rates for Control of Perennial Grasses

Perennial Grass	Herbicide and Application Rate		Plant Size
Bermudagrass	First Application		
	Poast	1.5 pt/A[1]	stolons (runners) 6 inches or less
	Poast Plus	2.25 pt/A[1]	stolons (runners) 6 inches or less
	Select	8-16 oz/A[2]	stolons (runners) 3-6 inches
	Second Application		
	Poast	1.0 ptA[1]	stolons (runners) 1-4 inches
	Poast Plus	1.5 pt/A[1]	stolons (runners) 1-4 inches
	Select	8-16 oz/A[2]	stolons (runners) 3-6 inches
Johnsongrass	First Application		
	Poast	1/5 pt/A[1]	plants 15-25 inches tall
	Poast Plus	2.25 pt/A[1]	plants 15-25 inches tall
	Select	8-16 oz/A[2]	plants 12-24 inches tall
	Second Application		
	Poast	1.0 pt/A[1]	plant/regrowth 6-12 inches tall
	Poast Plus	1.5 pt/A[1]	plant/regrowth 6-12 inches tall
	Select	6-8 oz/A[2]	plant/regrowth 6-18 inches tall

[1] *Apply Poast or Poast Plus with 2.0 pt/A crop-oil concentrate.*

[2] *Apply Select with 2.0 pt/A crop-oil concentrate.*

Table 15. Recommended Weed Sizes for Treatment and Application Rates for Control of Annual Broadleaf Weeds.

Species	1.0 pt/A Basagran		1.5 pt/A Basagran		2.0 pt/A Basagran		1.5 pt/A Storm	
	Max. Leaf Number	Max. Ht. (inches)	Max. Leaf Number	Max. Ht. (inches)	Max. Leaf Number	Max. Ht. (inches)	Max. Leaf Number	Max. Ht. (inches)
Prickly Sida	–	–[a]	6	3	6-8	4	4	2
Common ragweed	–	–	–	–	4-6[b]	3[b]	4-6	3
Cocklebur	2-4	4	2-6	6	6-10	10	2-6	6
Morningglory								
Pitted	–	–	4[c]	4[c]	SUD[c]	SUD[c]	4	4
Others	–	–	4[c]	4[c]	SUD[c]	SUD[c]	4	4
Smartweed	4[g]	4[g]	6	6	6-10	10	6	6
Jimsonweed	4	4	6	6	6-10	10	6	6
Pigweed	–	–	–	–	–	–	–	–
Lambsquarters	–	–	6[d]	1.5[d]	4-8[d]	2[d]	4-6	2
Tropic croton	–	–	2	2	2-4	4	6[i]	6[i]
Spurred anoda	–	–	6	3	6-8	4	4[h]	2[h]
Velvetleaf	–	–	4[a]	2[a]	4-6	5	4[h]	2[h]
Eclipta	–	–	–	–	–	–	–[j]	–[j]

Species	1.0 pt/A Blazer[e]		1.5 pt/A Blazer[e]		2.0 pt/A Blazer[e]		12.5 fl oz/A Cobra	
	Max. Leaf Number	Max. Ht. (inches)	Max. Leaf Number	Max. Ht. (inches)	Max. Leaf Number	Max. Ht. (inches)	Max. Leaf Number	Max. Ht. (inches)
Prickly Sida	–	–	–	–	–	–	4	–
Common ragweed	2	<2	4	4	6	3	8	–
Cocklebur	–	–	–	–	2-4	2-4	6	–

Table 15. Recommended Weed Sizes for Treatment and Application Rates for Control of Annual Broadleaf Weeds.

	1.0 pt/A Blazer[e]		1.5 pt/A Blazer[e]		2.0 pt/A Blazer[e]		12.5 fl oz/A Cobra	
Species	**Max. Leaf Number**	**Max. Ht. (inches)**	**Max. Leaf Number**	**Max. Ht. (inches)**	**Max. Leaf Number**	**Max. Ht. (inches)**	**Max. Leaf Number**	**Max. Ht. (inches)**
Morningglory								
Pitted	2	<2	4	2	4	2	4	–
Others	–	–	–	–	3	2	4[a]	–
Smartweed	–	–	–	–	4	4	–	–
Jimsonweed	3	3	6	6	8	8	4	–
Pigweed	–	–	4	2	6	3	–	–
Lambsquarters	–	–	–	–	3[e]	1[e]	–	–
Tropic croton	2	<2	2	2	2	2	4	–
Spurred anoda	–	–	–	–	–	–	–	–
Velvetleaf	–	–	–	–	–	–	–	–
Eclipta	–[f]	–[f]	–[f]	–[f]	–[f]	–[f]	6	–

[a] *Control not claimed on label.*
[b] *Add crop-oil concentrate according to label directions.*
[c] *See label for Special Use Directions. Label claims control only with two applications.*
[d] *Control of this species not claimed on peanut label but is claimed on soybean label. Add 2.0 pt of crop-oil concentrate/A.*
[e] *Add 1.0 pt of nonionic surfactant/100 gal of spray solution.*
[f] *Control not claimed on label. Experience indicates that 2.0 pt/A plus surfactant will suppress 1- to 2-inch Eclipta.*
[g] *Follow with second application of 1.0 pt/A, 7 to 14 days later if needed.*
[h] *Control may be inconsistent with this rate of Storm.*
[i] *Control not claimed on label, field experience indicates that Storm is very effective on tropic croton under 4 inches in height.*
[j] *Control not claimed on label, field experience indicates that Storm is effective on eclipta under 2 inches in height.*

Table 16. Restrictions on Feeding Herbicide-Treated Peanut Vines to Livestock and Preharvest Intervals for Peanut Herbicides

Herbicide	Preharvest Interval (PHI)	Do not feed treated vines to livestock	No feeding restrictions on label
Basagran	through pegging	within 50 days of treatment	X
Ultra Blazer	75 days	X	
Boa	28 days after GC[1]		X
Cadre	90 days	X	
Cobra	90 Days	X	
Dual Magnum	90 days	within 30 days of treatment	X
Frontier/Outlook	80 days	within 80 days of treatment	X
Gramoxone	28 days after GC[1]		X
Lasso	GC[1]	X	X
Poast/Poast Plus	40 days	X	X
Prowl	preplanting		X
Pursuit	85 days	X	
Select	40 days	X	
Sonalan	preplanting	X	
Strongarm	30 days	X	
Storm	75 days	X	
Valor			X
2,4-DB (Butyrac, Butoxone)	45 days	X	

[1]*GC = ground cracking*

Table 17. Suggested Rain-Free Periods after Applications of Postemergence Herbicides and Tank Mixes

Herbicide or tank mix	Rain-free period (hours)
2,4-DB	NR1
Basagran	NR2
Ultra Blazer	NR2
Cadre	3
Cobra	0.5
Gramoxone/Boa	0.5
Poast/Poast Plus	1
Pursuit	1
Select	1
Storm	NR2

NR1 = No restrictions on label. Suggest at least 1 hour for best results.
NR2 = No restrictions on label. Suggest 4 to 6 hours for best results.

Table 18. Adjuvant Recommendations for Postemergence Herbicides

Herbicide	Application Method	Adjuvant recommendations
Basagran	Ground	2.0 pt/A crop-oil concentrate when treating lambsquarters, common ragweed, hemp sesbania, or yellow nutsedge. Vegetable oils may be used. Use 1.0 gal/A of 30% nitrogen instead of crop-oil concentrate if velvetleaf is the primary target weed.
	Air	1.0 pt/A crop-oil concentrate when treating lambsquarters, common ragweed, hemp sesbania, or yellow nutsedge. Vegetable oils may be used. Do not use 30% nitrogen with aerial applications.
Ultra Blazer	Ground or Air	Use 0.125 percent nonionic surfactant for most weeds. For lambsquarters, hemp sesbania, or cowpea, use 0.25 percent nonionic surfactant or 0.5 to 1.0 gal/A of 30% nitrogen.
Cadre	Ground only	Use 0.25 percent nonionic surfactant or 2 pt/A crop-oil concentrate.
Cobra	Ground only	Add nonionic surfactant at 1 qt/100 gallons or petroleum or vegetable based crop oil concentrate at 1 to 1.5 pt per acre (See label for specifics).
Select	Ground	Always use 2.0 pt/A crop-oil concentrate.
Boa Gramoxone	Ground	Use 0.125 percent nonionic surfactant in cracking stage sprays.
Poast Poast Plus	Ground or Air	2.0 pt/A crop-oil concentrate. Vegetable oils may be used.
Pursuit	Ground	Use a petroleum or vegetable seed based oil concentrate at a rate of 1.5 to 2.0 pt/A **or** a nonionic surfactant containing at least 80% active ingredient at 1 qt/100 gallons of spray mixture.
Storm	Ground or Air	2.0 pt/A crop-oil concentrate. Vegetable oils may be used.

Note: Information in this table was taken from product labels. See the labels. See the labels for adjuvant recommendations with specific tank mixes.

Adjuvant rates given in percentages are on a volume/volume basis:

0.125% - 1 pt per 100 gal of spray solution; 0.50% - 2 qt per 100 gal of spray solution;

0.25% - 1 qt per 100 gal of spray solution; 1.00% - 4 qt per 100 gal of spray solution.

Table 19. Rotation Restrictions for Peanut Herbicides

	Rotational Crop							
	Corn	Cotton	Soy-beans	Barley	Winter Rye	Winter Wheat	Sorg-hum	Tobacco
Basagran	NS	NS	NS	NS	NS	NS	NS	NS
Ultra Blazer	AH	AH	NR	AH	AH	AH	AH	AH
Cadre	9M	18M	9M	18M	4M	4M	18M	9M
Cobra	NR	NR	NR	NR	NR	NR	NR	NR
Dual (PRE, PPI, cracking)	NR	NR	NR	4.5M	4.5M	4.5M	NR	FY
Dual (layby)	FY	FY	FY	FY	FY	FY	FY	FY
Frontier /Outlook	NR	FY	NR	4M	4M	4M	FY	FY
Lasso	NR	NR	NR	NR	NR	NR	NR	NR
Poast	NR	NR	NR	NR	NR	NR	NR	NR
Poast Plus	NR	NR	NR	NR	NR	NR	NR	NR
Prowl	FY	NR	NR	4M	FY	4M	FY	NR
Pursuit	NR /8.5M[1]	9.5M /18M[2]	NR	9.5M	4M	4M	18M	9.5M
Select	NR	NR	NR	NR	NR	NR	NR	NR
Sonalan	FY	FY	NR	AH	AH	AH	FY	FY
Strongarm	18M /10M[3]	10M	NR	4M	6M	4M	18M	18M
Storm	AH	AH	NR	AH	AH	AH	AH	AH
2,4-DB	NS	NS	NS	NS	NS	NS	NS	NS
Sequence	NR	NR	NR	4.5M	4.5M	4.5M	NR	FY
Valor	4M[4]	1M	NR	4M	4M	1M	1M	1M

The above table provides a general summary of crop rotation restrictions specified on the labels of herbicide products commonly used for peanuts. Consult product labels for details and specific information.

KEY: M = month; FY = following year; NR = no restrictions; AH = after harvest; NS = Crop rotation sequence not specified in label directions

[1] *IMI-Corn (resistant/tolerant varieties) = NR, Non IMI-Corn = 8.5M*

[2] *For sandy loam to loamy sand soils 16 inches of rainfall or irrigation occurring from application through October, 9.5M; (refer to supplemental label of Virginia/North Carolina) otherwise, 18M.*

[3] *With IMI-corn (resistant/tolerant varieties) = 10 M, Non IMI-corn 18M.*

[4] *1M restriction for sweet corn, 4M for field corn.*

INSECT CONTROL IN PEANUTS

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Thrips

Seedling peanut plants are usually attacked by thrips within the first 6 to 8 weeks after planting, and thrips may complete several generations per season under favorable conditions. These tiny, spindle-shaped insects feed primarily within the developing, unfolded leaflets causing crinkling of the leaflets and stunting of the plants. Blackening of the small leaflets occurs with severe infestations and can be mistaken for chemical injury. Under favorable conditions, plants normally outgrow this injury with no reduction in yield or grade. However, the delay in vine growth from early-season thrips injury may retard maturity. This in combination with other injury, such as herbicide burn, can reduce yield.

Thrips can be controlled with either systemic or with foliar-applied insecticides. Systemics can be incorporated in the furrow with the seed at planting. Foliar treatments can be applied as needed after crop emergence. During dry seasons or seasons with excessive rains, the systemic insecticides may not give adequate thrips control due to poor systemic uptake by the plants or leaching of chemicals from the soil. Foliar treatments may be warranted to allow more rapid plant growth to assist in weed control if systemics are ineffective, or if injury appears excessive. Foliar treatment is recommended when 25 percent of the leaves show thrips damage and pest populations are still active.

Table 20. Recommended Insecticides for Thrips Control

Treatment	Insecticide (Formulation)	Amount product per acre	Time limits: days before harvest	Remarks
Foliar	methomyl (Lannate LV) (Lannate SP)	 1.5-3.0 pt 0.5-1.0 lb	 21 21	**RESTRICTED USE.** Do not feed treated vines.
	acephate (Orthene 97) band rate broadcast rate	 3.0-6.0 oz 6.0-12.0 oz	 14	Do not feed treated forage or hay to livestock or allow animals to graze treated areas.
	lambda-cyhalothrin (Warriot T) (Karate Z) (Karate EC)	 2.56-3.84 oz 1.28-1.92 oz 2.56-3.84 oz	 14 14 14	**RESTRICTED USE**. Do not apply more than 15.36 oz/A/season. Do not graze livestock in treated areas, or use treated vines or hay for animal feed.
	gamma-cyhalothrin (Proaxis) (Prolex)	 2.56-3.84 oz 1.02-1.54 oz	 14 14	**RESTRICTED USE**.
	beta-cyfluthrin (Baythroid XL)	 2.8 oz	 14	**RESTRICTED USE.**
In-furrow	disulfoton (Di-Syston 15G)	 6.7-13.3 lb	 --	**RESTRICTED USE.** Place granules in a band on each side of the seed furrow at planting, or as a side dressing at pegging. Do not apply directly on the seed. Do not feed treated vines.
	phorate (Thimet 20G)	 5.0 lb	 90	**RESTRICTED USE.** Distribute granules evenly in the furrow. Do not graze or feed treated hay or forage to livestock.

Table 20. Recommended Insecticides for Thrips Control (cont.)

Treatment	Insecticide (Formulation)	Amount product per acre	Time limits: days before harvest	Remarks
In-furrow cont.	aldicarb (Temik 15G) In Twin rows	7.0 lb 5.0-7.0 lb/ row	90	**RESTRICTED USE.** Apply granules in seed furrow and cover with soil. Do not hog-off treated fields. Do not feed green forage, hay or straw to livestock. Do not plant corn, small grains, or forages within 12 months after last application.
	acephate liquid in furrow (Orthene 97)	12.0-16.0 oz	14	Apply as a liquid into the seed furrow in 3 to 5 gal of water/A with a system that ensures good seed coverage. Do not feed treated forage or hay to livestock or allow animals to graze treated areas.
	on seed (Orthene 75S)	4.0 oz/100 lb seed	14	Mix in the planter to obtain good coverage of ALL seed by layering seed and product. Fill the planter box 1/3 full of seed with 1/3 cup of the product, add the next 1/3 of the seed and product; then add the last 1/3 of the seed and product. Gently stir each layer before adding the next. CAUTION: Do not use with seed inoculants. Not recommended for air planters. Do not use treated seed for food or feed purposes or process for oil.

Potato Leafhopper

The potato leafhopper is a common “above ground” pest of peanuts in Virginia. This small, wedge-shaped, light green to yellow insect damages the peanut plant by feeding on the undersides of leaves in a piercing-sucking manner. The injured leaf tips first turn yellow then brown and tend to curve downward. During feeding, toxins also are passed into plants at feeding sites. If enough damage is done, the toxins can stop vine growth, resulting in reductions in yield and grade. Injury may occur at any time from early June to the middle of August or later in some years. It is important to note that although late-season damage appears worse in some years, damage done early in the season probably has a greater effect on plant vigor and yield. Systemic insecticides applied at planting time will usually control potato leafhoppers that occur early, but if no pegging-time insecticide is applied, it may be necessary to make one or two foliar applications in July or early August. Pegging-time applications of rootworm insecticides will usually control leafhoppers from that time until harvest.

Foliar treatments should be made only on a basis of need. When 25 percent of the leaves show tip yellowing typical of leafhopper damage and active adult and immature leafhoppers are seen, treat with an effective chemical. When foliar treatments are required, the first application usually is made about mid-July, and the second about the first of August (if needed). If scheduled treatments are being made for control of leafspot, insecticides may be tank mixed. Do not include insecticides with all leaf-spot treatments as a matter of course. Too many insecticide applications, or applications later in the season, could cause spider mite populations to increase, especially in dry years after adjacent corn and weedy areas have been cut. Make leafhopper applications only when problems have been identified.

Table 21. Recommended Insecticides for Potato Leafhopper Control

Treatment	Insecticide (Formulation)	Amount product per acre	Time limits: days before harvest	Remarks
Foliar	methomyl (Lannate LV) (Lannate SP)	 0.75-3.0 pt 0.25-1.0 lb	 21 21	**RESTRICTED USE.** Do not feed treated vines.
	acephate (Orthene 97)	6.0-12.0 oz	14	Do not feed treated forage or hay to livestock or allow animals to graze treated areas.
	lambda-cyhalothrin (Warrior T) (Karate Z)	 1.92-3.2 oz 0.96-1.6 oz	 14 14	**RESTRICTED USE.** Do not apply more than 15.36 oz/A/season. Do not graze livestock in treated areas or use treated vines or hay for animal feed.
	esfenvalerate (Asana XL)	2.9-5.8 oz	21	**RESTRICTED USE.** Do not feed or graze livestock on treated vines. Do not exceed 29 oz/A/season.
	fenpropathrin (Danitol 2.4EC)	6.0-10.6 oz	14	**RESTRICTED USE.** Do not graze or feed treated vine forage or dried hay within 14 days of the last application. Do not exceed 2.6 pt /A/ season.
	gamma-cyhalothrin (Proaxis) (Prolex)	 1.92-3.2 oz 0.77-1.28 oz	 14 14	**RESTRICTED USE**.
	beta-cyfluthrin (Baythroid XL)	 1.0-1.8 oz	 14	**RESTRICTED USE.**
Pegging*	chlorpyrifos (Lorsban 15G)			Lorsban 15G is not labeled for use against leafhopper but will provide suppression if applied for soil insects.
	phorate (Thimet 20G)	10.0 lb	90	**RESTRICTED USE.** Distribute granules as a band over the fruiting zone at pegging. Work into the top few inches of soil immediately. Do not graze or feed treated hay or forage to livestock.

* **GENERAL** - *Apply pegging treatments in 10- to 18-inch bands on row from the last week in June through mid-July after pegging begins and before vines close in middles. Effectiveness of treatments is increased if insecticides are covered by shallow cultivation to avoid exposure to sunlight and lateral movement with heavy rains.*

Table 21. Recommended Insecticides for Potato Leafhopper Control (cont.)

Treatment	Insecticide (Formulation)	Amount product per acre	Time limits: days before harvest	Remarks
In-furrow	disulfoton (Di-Syston 15G)	6.7-13.3 lb	–	**RESTRICTED USE.** Place granules in a band on each side of the seed furrow at planting, or as a side dressing after emergence. May also be applied in a band over the row or as a side dressing at pegging. Do not apply directly on the seed. Do not feed treated vines.
	phorate (Thimet 20G)	5.0 lb	90	**RESTRICTED USE.** Distribute granules evenly in the furrow. Do not graze or feed treated hay or forage to livestock.

* **GENERAL** - *Apply pegging treatments in 10- to 18-inch bands on row from the last week in June through mid-July after pegging begins and before vines close in middles. Effectiveness of treatments is increased if insecticides are covered by shallow cultivation to avoid exposure to sunlight and lateral movement with heavy rains.*

Southern Corn Rootworm

The southern corn rootworm, which is the immature stage of the spotted cucumber beetle, can cause extensive injury to the Virginia peanut crop. Rootworm larvae develop in the soil and feed directly on pegs and pods. Finding rootworms in the soil is very difficult and injury is often not detected until after peanuts are dug when it is too late for control measures. A preventive treatment is the best strategy. After an infestation is established, control is difficult and often ineffective. Determining the need to treat for southern corn rootworm should be done on a field-by-field basis. Decisions can be based on both adult populations and past history of peanut fields. Adult beetles can be readily detected in peanut fields. Their presence in moderate to high numbers from mid-July to early August should be a warning that a problem could develop. Adults will lay eggs that could develop into the damaging larval stage. Thus, early detection of adults can allow for timely treatment and prevention of injury.

Knowledge of the past history of rootworm injury also can be useful in determining the need for treatment. If injury has ever occurred in a field, it will likely occur in other years. Keep field records on the extent of pod and peg injury noticed at harvest time. Pay particular attention to fields with higher levels of organic

matter and clay. Rootworms have a higher survival rate in those soils due to higher moisture holding capacity, and injury will typically be more severe than in "light" soils. Use the "Peanut Rootworm Advisory" (VCE Publication 444-351) to aid you in deciding which fields need insecticide treatment.

If rootworm treatments are necessary, they should be applied as 10- to 18-inch bands on the row during early pegging. Usually, this period occurs from the last week in June through mid-July. Treatment effectiveness is increased if materials are lightly incorporated using shallow cultivation. If vine growth and pegging are in an advanced stage, do not cultivate, as vine "dirting," which leads to disease development and injury to pegs, may offset the gain from insect control. Carefully calibrate equipment to deliver recommended insecticide rates. Using more than is recommended will not increase effectiveness and using less could result in a complete insecticide failure.

Table 22. Recommended Insecticides for Southern Corn Rootworm Control

Treatment	Insecticide (Formulation)	Amount product per acre	Time limits: days before harvest	Remarks
Pegging[1]	chlorpyrifos (Lorsban 15G)	13.0 lb	21	Do not apply more than 13.3 lb/season. Do not feed peanut forage or hay to meat or dairy animals.
	phorate (Thimet 20G[2])	10.0 lb	90	**RESTRICTED USE.** Distribute granules as a band over the fruiting zone at pegging. Work into the top few inches of soil immediately. Do not graze or feed treated hay or forage to livestock.

[1] **GENERAL -** *Apply pegging treatments in 10- to 18-inch bands on row from the last week in June through mid-July after pegging begins and before vines close in middles. Effectiveness of treatments is increased if insecticides are covered by shallow cultivation to avoid exposure to sunlight and lateral movement with heavy rains.*

[2] *Label stipulates light soil incorporation.*

Corn Earworm and Fall Armyworm

Annual infestations of the corn earworm and fall armyworm occur in most Virginia peanut fields. Usually there is a single generation of each species per season. Worms feed on leaf tissue causing peanuts to look ragged; however, research has shown that one-third of peanut foliage can be lost at the normal time of corn earworm infestations (mid-August to early September) without loss of yield or grade. Scouting fields is the only way to determine if treatment is needed. Scout by reaching halfway across 2 row-feet of plants and shaking foliage vigorously towards the row middle. Repeat on the opposite row. Count the worms on the ground and repeat the sample in several spots in the field. Treatment is recommended if an average of 8 or more worms are found per sample, or 4 per row-foot. This number should increase to 6 per row-foot later in the season.

If treatment is necessary, apply sprays using systems that provide good canopy penetration and coverage. If spider mites are already present in the field, use of some insecticides may allow for rapid build-up. Scout fields for treatment effectiveness and for possible increases in spider mite activity soon after applications.

Table 23. Recommended Insecticides for Corn Earworm Control

Treatment	Insecticide (Formulation)	Amount product per acre	Time limits: days before harvest	Remarks
Foliar*	carbaryl (Sevin 4F) (Sevin 80S) (Sevin XLR PLUS)	 2.0-3.0 pt 1.25-1.87 lb 2.0-3.0 pt	 0 0 0	To avoid possible injury to foliage, do not apply to wet foliage or during periods of high humidity.
	acephate (Orthene 97)	12.0-16.0 oz	14	Do not feed treated forage or hay to livestock or allow animals to graze treated areas.
	methomyl (Lannate LV) (Lannate SP)	 0.75-3.0 pt 0.25-1.0 lb	 21 21	**RESTRICTED USE.** Do not feed treated vines.
	esfenvalerate (Asana XL)	2.9-5.8 oz	21	**RESTRICTED USE.** Do not feed or graze livestock on treated vines. Do not exceed 29.0 oz/season.
	lambda-cyhalothrin (Warrior T) (Karate Z) (Karate EC)	 2.56-3.84 oz 1.28-1.92 oz 2.56-3.84 oz	 14 14 14	**RESTRICTED USE.** Do not graze livestock in treated areas, or use treated vines or hay for animal feed. Do not exceed 15.36 oz/A/ season.
	fenpropathrin (Danitol 2.4EC)	10.6-16.0 oz	14	**RESTRICTED USE.** Do not graze or feed treated peanut vine forage or dried hay within 14 days of the last application. Do not exceed 2.6 pt/A/season.
	gamma-cyhalothrin (Proaxis) (Prolex)	 2.56-3.84 oz 1.02-1.54 oz	 14 14	**RESTRICTED USE**.
	beta-cyfluthrin (Baythroid XL)	1.8-2.4 oz	14	**RESTRICTED USE.**
	indoxacarb (Steward EC)	9.2-11.3 oz	14	Do not feed or graze livestock on treated fields.
	spinosyn (Tracer 4SC)	1.5-3.0 oz	3	Do not allow grazing of crop residue or harvest of crop residue for hay until 14 days after last application.

* **GENERAL** - *Treat ONLY IF foliage loss is heavy (1/3 or more). Earworms are easier to control when they are less than 1/2 inch long.*

Table 24. Recommended Insecticides for Fall Armyworm Control

Treatment	Insecticide (Formulation)	Amount product per acre	Time limits: days before harvest	Remarks
Foliar	methomyl (Lannate LV) (Lannate SP)	 0.75-1.5 pt 0.25-0.5 lb	 21 21	**RESTRICTED USE.** Do not feed treated vines. High rates may be required for good control.
	esfenvalerate (Asana XL)	9.6 oz	21	**RESTRICTED USE.** Suppression only. Do not feed or graze livestock on treated vines. Do not exceed 29.0 oz/season.
	acephate (Orthene 97)	12.0-16.0 oz	14	Do not feed treated forage or hay to livestock or allow animals to graze treated areas.
	lambda-cyhalothrin (Warrior T) (Karate Z) (Karate EC)	 2.56-3.84 oz 1.28-1.92 oz 2.56-3.84 oz	 14 14 14	**RESTRICTED USE.** Do not graze livestock in treated areas, or use treated vines or hay for animal feed. Do not exceed 15.36 oz/A/season.
	fenpropathrin (Danitol 2.4EC)	10.6-16.0 oz	14	**RESTRICTED USE.** Do not graze or feed treated peanut vine forage or dried hay within 14 days of the last application. Do not exceed 2.6 pt/A/season.
	gamma-cyhalothrin (Proaxis) (Prolex)	 2.56-3.84 oz 1.02-1.54 oz	 14 14	**RESTRICTED USE**.
	beta-cyfluthrin (Baythroid XL)	2.4-2.8 oz	14	**RESTRICTED USE.**
	indoxacarb (Steward EC)	9.2-11.3	14	Do not feed or graze livestock on treated fields.
	spinosyn (Tracer 4SC)	2.0-3.0 oz	3	Do not allow grazing of crop residue or harvest of crop residue for hay until 14 days after last application.

Spider Mite

Mites, which have become more numerous during the past several years, are especially injurious during hot, dry weather. While insecticides are very valuable in controlling leafhoppers, thrips, and worms, they may be responsible for destroying some of the natural enemies of spider mites, thus promoting the build-up of mite populations. Insecticides should be used **only when needed** for insect control. Tank mixes including fungicides and insecticides are more likely to allow spider mite build-up than when either material is used separately.

Spider mites feed mainly on the undersides of the leaves. They suck the juice from the foliage and cause the leaves to turn brown and eventually drop off. Heavy infestations usually first occur around the borders of peanut fields; then they spread inward throughout the fields. Avoid mowing weedy areas next to peanut fields until peanuts are harvested. Spider mites will readily move into peanuts when corn dries down or is harvested. Be prepared to treat peanuts if adjacent corn is infested.

IMPORTANT: If you are going to treat, calibrate your equipment to deliver the right amount of pesticide per acre. Arrange and adjust the nozzles or spouts in a manner that will direct the chemical into the desired area to be treated. Adequate sprayer pressure (40 to 60 psi) will aid in getting chemicals in contact with the undersides of leaves and within denser foliage. Penetration of foliage with 20 to 30 gal of water per acre is very important for the control of spider mites.

Table 25. Recommended Insecticides for Spider Mite Control

Treatment	Insecticide (Formulation)	Amount product per acre	Time limits: days before harvest	Remarks
Foliar	propargite (Comite 6.5EC) (Omite 30W)	 2.0 pt 3.0-5.0 lb	 14 14	Use a minimum of 20 gal/A with ground equipment or 5 gal by air. Make no more than 2 applications/year (either Comite **OR** Omite). Do not plant rotational crops within 6 months of last application. Do not feed hay to livestock.
	aldicarb (Temik 15G)	 7.0 lb	 90	**RESTRICTED USE.** Apply in 12- to 18-inch band on the row at pegging, immediately incorporate into soil. Do not hog-off treated fields. Do not feed green forage, hay, or straw to livestock. Must be applied at the onset of pegging to comply with 90-day tolerance time.
	lambda-cyhalothrin (Warrior T) (Karate Z)	 3.84 oz 1.92 oz	 14 14	**RESTRICTED USE.** **Suppression only**. Do not graze livestock in treated areas or use treated vines or hay for animal feed. Do not exceed 15.36 oz/A/season.
	gamma-cyhalothrin (Proaxis) (Prolex)	 3.84 oz 1.54 oz	 14 14	**RESTRICTED USE.** **Suppression only**.
	fenpropathrin (Danitol 2.4EC)	 10.6-16.0 oz	 14	**RESTRICTED USE.** Do not graze or feed treated vine forage or dried hay within 14 days of the last application. Do not exceed 2.6 pt/A/season.

Lesser Cornstalk Borer

Lesser cornstalk borer typically is not a problem in Virginia peanut fields. However, it does thrive under hot dry conditions and can become a problem when those conditions continue for 3 to 4 weeks. Infestations will be most severe where soils are sandy and in high, well drained areas within fields. Larvae are 0.5 to 0.75 inch long and are banded with alternating brown and blue stripes. They wiggle vigorously when disturbed. Larvae feed by burrowing into main stems, lateral limbs, plant crowns, and pods and can do extensive damage, even kill plants. Larvae produce a silk-and-sand web tube which is attached to pods or stems at the point of feeding. Evidence of web tubes is a sure sign of borer activity.

If weather conditions become favorable for borers, survey fields for damaged plants and larvae. If damage is obvious and active larvae are still present in 10 percent or more of the plants, treatment is recommended.

Table 26. Recommended Insecticides for Lesser Cornstalk Borer Control

Treatment	Insecticide (Formulation)	Amount product per acre	Time limits: days before harvest	Remarks
Granular	chlorpyrifos (Lorsban 15G)	6.7-13.3 lb	21	Apply in 10- to 18-inch band on row at first sign of borer. Do not feed peanut forage or hay to meat or dairy animals. Do not apply more than 13.3 lb/season. 10.0-13.0 lb may be broadcast by air as a rescue treatment.

Table 27. Recommended Insecticides for Grasshopper Control

Foliar	carbaryl (Sevin 80S) (Sevin XLR PLUS)	 1.5 lb 1.0-2.0 pt	 0 0	To avoid possible injury to foliage, do not apply to wet foliage or during periods of high humidity.
	acephate (Orthene 97)	4.0-8.0 oz	14	Do not feed treated forage or hay to livestock or allow animals to graze treated areas.
	esfenvalerate (Asana XL)	5.8-9.6 oz	21	**RESTRICTED USE.** Do not feed or graze livestock on treated vines. Do not exceed 29.0 oz/season.
	beta-cyfluthrin (Baythroid XL)	1.8-2.4 oz	14	**RESTRICTED USE.**

Pesticide Usage Charts

Many pesticides control more than one pest. The three following tables summarize the effectiveness of some popular pesticides used at time of planting, at time of pegging, or as foliar treatments for the control of major insect pests which attack peanuts.

Table 28. Insecticide Activity of Products Applied at Time of Planting

	Pests			
Chemical	**Thrips**	**Leafhopper**	**Rootworm**	**Spider Mite**
Temik	E	Early	P	may aid early
Di-Syston	G	Early	P	No
Thimet	G	Early	P	No
Orthene	E	Early	No	No

Table 29. Insecticide Activity of Granules Applied at Time of Pegging

	Pests			
Chemical	**Rootworm**	**Leafhopper**	**Spider Mite**	**Corn Earworm**
Thimet	G	Aids	No	No
Temik	P	Aids	G	No
Lorsban[1]	E	G	No	No

[1] *NOT SYSTEMIC. Do not apply in the furrow.*

P=poor control, F=fair control, G=good control, E=excellent control, No=not labeled or no activity expected.

Table 30. Insecticide Activity of Foliar Treatments Applied When Pests are Present

		Pest Species Controlled						
Insecticide	Formulation	Thrips	Leaf-hopper	Root-worm	Corn Ear-worm	Fall Army-worm	Less Corn-stalk Borer	Spider Mite
Sevin[2]	4F, 80S, XLR PLUS	P	E	No	F	F	No	No
Malathion	57%EC	P	G	No	P	P	No	P
Lannate	L	P	G	No	E	G	No	No
Comite, Omite	6.5EC, 30W	No	No	No	No	No	No	E
Asana[2]	XL	No	E	No	E	G	No	No
Orthene[2]	97	E	E	No	G	F	No	No
Karate	Z	E	E	No	E	G	No	F
Danitol	2.4EC	No	E	No	E	G	No	E
Steward	1.25SC	No	No	No	E	E	No	No
Tracer	4SC	No	No	No	E	E	No	

There are other insecticides and other formulations which have federal registration for use on peanuts.

[2] *Use of these insecticides may allow rapid build-up of spider mites. Use with caution during extended periods of dry weather.*

P=poor control, F=fair control, G=good control, E=excellent control, No=not labeled or no activity expected.

Peanut Diseases

P.M. Phipps, Extension Plant Pathologist, Tidewater AREC

Management Tools

Advisory Programs

A network of weather monitors in southeastern Virginia record data for improving the efficiency of disease management. These data are collected electronically and used to produce daily advisories and reports for growers and industry workers. Included are daily weather summaries (air and soil temperature, rainfall), peanut leaf spot and Sclerotinia blight advisories, heat-unit reports for peanuts, and degree-day reports for cotton. The Peanut Frost Advisory is provided during the fall-harvest period. Each program is designed to guide growers in making decisions that maximize yield, quality, and net profit. The Tidewater Agricultural Research and Extension Center (AREC) in cooperation with Extension agents, growers, and the industry make this information available in the following ways:

Peanut/Cotton InfoNet: Information from 4 weather monitors is available on the Internet at *http://www.ipm.vt.edu/infonet/*. Contact your local Extension agent or call, (757) 657-6450 and ask for Pat Phipps, Steve Byrum, or Barron Keeling if you need assistance in accessing or interpreting the information.

Hotlines: Disease advisories, heat units, and frost advisories are recorded daily at the Tidewater AREC for access by telephone. Regional advisories for Capron, Waverly, and Suffolk are available by calling (800) 795-0700. The information is also available through local county Extension offices. Numbers for obtaining the local reports are announced annually in agent newsletters.

Radio Broadcasts: Recordings of advisories are broadcast daily by WLPM 1450 AM and WLQM 101.7 FM in Franklin, Virginia.

Clinical Services

Diagnostic services for plant diseases are provided by the Tidewater AREC in Suffolk. Plant samples should be submitted with the required forms by unit Extension agents. A period of 5 to 10 days is needed to complete biopsy tests and mail reports. Diagnostic tests for nematodes and soil fertility problems during the season are also performed in cooperation with laboratories at Virginia Tech.

Predictive Nematode Assay

This program provides data on the numbers and kinds of nematodes in the soil and recommendations on needs for control. Nematode population thresholds for damage to peanut, cotton, corn, and soybean are available on the Internet at *http://ipm-www.ento.vt.edu/states/va.html*. Soil samples must be collected in the fall no later than November 20. Local Extension offices have instructions, sample information sheets, and bags for packaging samples. A service charge of $11 per sample is required at the time of sample submission.

Management Inputs

The most effective and economical strategy for disease control combines the benefits of sanitation, crop rotation, resistant varieties, scouting, and judicious use of pesticides. Inputs for disease control should be determined on the basis of field history, scouting, disease advisory programs, and recommendations by Virginia Cooperative Extension. This approach to disease management will enable the judicious use of chemicals while providing for a maximum return on investments.

Sanitation

Moldboard plowing to bury crop residues is an important form of sanitation prior to planting peanuts. Soil and decayed plant debris may contain residual inoculum of disease-causing organisms. Wash equipment frequently to avoid transport of inoculum from field to field. Peanut combines should be cleaned to remove loose soil and plant material after harvesting fields with heavy infestations of soil-borne diseases. The removal and/or destruction of peanut vines after harvest has limited value for disease management because much of the diseased plant parts and inoculum remains intact in the field. Furthermore, this practice negates a significant part of the soil fertility benefits of peanut hay in the following year.

Crop Rotation

A 4-year rotation of peanut with corn, grain sorghum, fescue, and other grass-type crops is beneficial for control of peanut diseases. Cotton is also a good rotational crop for peanuts in Virginia, but growers should not apply potash (K) in excess of recommended rates of the soil test report. Elevated levels of potash can interfere with calcium uptake and result in pod rot by fungi such a *Rhizoctonia* and *Pythium* species. Soybean and other leguminous crops share many of the common destructive diseases with peanuts and should be avoided. Where soybean is grown in a peanut rotation, double-crop soybean with wheat and follow with either cotton, corn, or another grass-type crop.

Resistant Varieties

No peanut varieties are immune to disease, but there is a wide range in susceptibility. Some important differences are noted below with respect to the most common diseases.

Cylindrocladium black rot (CBR): NC 12C and Perry are partially resistant to CBR. Resistance is improved by good nematode control and delayed planting to May 10 or later. Cool, wet conditions at planting favor epidemics of CBR.

Sclerotinia blight: Perry is partially resistant to this disease. Early planting at seed rates of 110 lb/A or lower can reduce the susceptibility of varieties in some years. However, this practice will increase the risk of tomato spotted wilt disease. NC 9 and NC 12C are highly susceptible to Sclerotinia and should be avoided.

Early leaf spot: NC 7, NC-V 11, Wilson, and NC 12C are moderately susceptible. All other Virginia-type varieties are susceptible.

Web blotch: Perry has good resistance, whereas NC-V 11 and VA 98R are highly susceptible.

Tomato spotted-wilt virus: NC 7, VA 98R and Perry are highly susceptible. Champs has partial resistance and NC-V 11 and Gregory are somewhat less susceptible than other varieties. Reduced plant populations and planting before May 1 sometimes increases disease incidence.

Scouting

Peanut fields should be scouted once a week for disease after pegging. Scouts should use different entry and exit points as well as travel patterns across fields at each visit. After a canopy of foliage covers the soil, scouts should part the vines and look for signs of soilborne diseases on plant stems at the soil surface (e.g. Sclerotinia, Southern stem rot, and CBR).

Chemicals

A wide array of chemicals are registered for disease control in peanuts. Selection of the most effective/economical chemical requires knowledge of the target disease and other diseases in the field. Whenever the cause of disease is uncertain, plant samples should be submitted for diagnostic tests in the plant pathology clinic at the Tidewater AREC. If nematode or soil fertility problems are suspected, a 1-pt sample of soil should be submitted. The Peanut/Cotton InfoNet and Peanut Hotlines are important sources of information on timing of fungicide applications to control leaf spot and Sclerotinia blight. The following tables provide listings of approved chemicals for control of specific disease problems.

READ THE LABEL INSTRUCTIONS ATTACHED TO PESTICIDE CONTAINERS BEFORE APPLICATION.

Table 31. Seed Treatments[1]

Disease	Product and Formulation	Rate of Formulation	Method and Timing of Application	Precautions and Remarks
Seed decay and seedling disease	Allegiance-FL or Apron 50W	0.75 fl oz 0.5-1.0 oz	Apply as water-based slurry with commercial seed treatment equipment.	Control Pythium seed rot and damping-off. Use in combination with a broad-spectrum fungicide.
	Maxim 4FS	0.08-0.16 fl oz	Same as above.	Protects against seed decay, damping-off, and seed transmission of CBR.
	Captan 30DD or Captan 400	6.0 fl oz 3.0-6.0 fl oz	Same as above.	Protects against seed decay, damping-off, and seedling blights.
	RTU-PCNB	1.75-2.5 fl oz	Same as above.	Same as above.
	42-S Thiram	3.0 fl oz	Same as above.	Same as above.
	Vitavax-30C	3.0 fl oz	Same as above.	Controls Sclerotium rot and damping-off. Use in combination with a broad-spectrum fungicide.
	Thiram 50WP	4.5 oz	Apply with dust treater.	Controls seed decay, damping-off, and seedling blights.
	Vitavax PC (captan, PCNB, Vitavax)	4.0-5.0 oz	Same as above.	Same as above.
	Trilex Optimum DS (captan, trifloxystrobin, metalaxyl)	4.0 oz	Same as above.	Same as above.

Table 31. Seed Treatments[1] (cont.)

Disease	Product and Formulation	Rate of Formulation	Method and Timing of Application	Precautions and Remarks
Seed decay and seedling disease (cont.)	Trilex Star DS (captan, trifloxystrobin, thiophanote-methyl, metalaxyl)	4.0 oz	Same as above.	Same as above.
	Dynasty PD (azoxystrobin, fludioxonil, mefenoxam)	4.0 oz	Same as above.	Same as above, and reduces seed transmission of CBR.

[1] *All rates of seed treatments are formulated product/100 lb seed. Do not use treated seed for food, feed, or oil purposes. Bags with treated seed should bear a tag or label cautioning their use for these purposes as well as against the reuse of bags for packing feed or foodstuffs. Read use restrictions on labels and follow all labeling requirements for packaging treated seed.*

Table 32. Foliar Fungicides[1]

Disease	Product and Formulation	Rate of Formulation	Method and Timing of Application	Precautions and Remarks
Cercospora leaf spot, web blotch	Bravo 720 Bravo Ultrex 82.5 WDG Bravo S Echo 720 Echo 90DF Equus 720	1.5 pt 1.4 lb 4.25 pt 1.5 pt 1.2 lb 1.5 pt	Apply according to leaf-spot advisory program.	**Caution**. Sclerotinia blight will be more difficult to control when these products are applied at intervals of less than 21 days.
	Bravo 720 + SoyOil 937	1.0-1.5 pt 0.5-1.0% V/V	Same as above.	Same as above.
	Propimax EC + Echo 720	2.0 fl oz 1.0 pt	Same as above.	Same as above.
	Echo PropiMax Co-Pack	Use contents to treat 10 acres	Same as above.	Co-Pack is a mixture of Propimax and Echo.

[1] *All rates are listed as formulated product/A. Read labels and observe all precautions and restrictions on application, pre-harvest interval, and restrictions on feeding treated hay, vines, or hulls to livestock. For best results, apply sprays according to leaf-spot advisory program in a volume of 12.0 to 15.0 gal/A by ground sprayers or 5.0 gal/A with aircraft.*

Table 32. Foliar Fungicides[1] (cont.)

Disease	Product and Formulation	Rate of Formulation	Method and Timing of Application	Precautions and Remarks
Cercospora leaf spot, web blotch (cont.)	*TILT*-Bravo Twin Pack (equal to Tilt 3.6EC 2 fl oz + Bravo 720 1.0 pt/A)	Same as above.	Same as above.	Twin Pack is a mixture of Tilt and Bravo. Do not add Latron AG-98 or Latron B-1956 as phytotoxicity may result.
	TILT- Bravo SE	1.5 pt	Same as above.	Same as above.
	Folicur 3.6F + surfactant	7.2 fl oz Use lowest rate recommended on label of surfactant	Apply according to leaf spot advisory program	Also controls stem rot and suppresses pod rot diseases. The final spray of the season must be a chlorothalonil product (e.g. Bravo) for resistance management.
	Stratego	7 fl oz	Same as above.	Label also allows up to 2 sprays at 14 fl oz/A for control of Rhizoctonia limb rot in addition to foliar diseases. Use chlorothalonil as final spray for resistance management.
	Abound 2.08F	9.3-12.3 fl oz	Same as above.	Use chlorothalonil as final spray for resistance management. See label for restrictions.
	Headline 2.09EC	6-9 fl oz	Same as above.	Make no more than 2 sequential sprays, then follow with chlorothalonil for resistance management.

Table 32. Foliar Fungicides[1] (cont.)

Disease	Product and Formulation	Rate of Formulation	Method and Timing of Application	Precautions and Remarks
Southern stem rot (*Sclerotium rolfsii*), Rhizoctonia pod and limb rot	Folicur 3.6F + surfactant	7.2 fl oz Use lowest rate recommended on label of surfactant	Apply with leaf-spot nozzles at spray volume of 15 gal/A starting at pegging.	Also controls leaf spot and suppresses pod rot by CBR. The total seasonal dose must not exceed 28.8 fl oz/A
	Artisan (equal to Tilt 4,0 fl oz + Moncut 1.2 lb/A)	18.5-24.6 fl oz	Apply 2 or 3 times starting 45 to 60 days after planting.	Also controls leaf spot, but always end season with chlorothalonil for resistance management.
	Moncut 50WP	1.5-2.0 lb	Tank mix with a leaf-spot fungicide spray or band over row in spray volume of 40 gal/A.	Two or 3 applications may be necessary, depending on disease pressure.
	Abound 2.08F	18.5-24.6 fl oz	Make 2 applications in spray volume of 15 gal/A between 60 and 90 days after planting.	Abound also controls early leaf spot and web blotch. Do not apply within 50 days of harvest. Do not use more than 49.2 fl oz/season.
	Headline 2.09EC	9.0-15.0 fl oz	Make no more than 2 sequential applications, then follow with non-strobilurin fungicide for resistance management.	Also controls leaf spot and web blotch.

[1] *All rates are listed as formulated product/A. Read labels and observe all precautions and restrictions on application, pre-harvest interval, and restrictions on feeding treated hay, vines, or hulls to livestock. For best results, apply sprays according to leaf-spot advisory program in a volume of 12.0 to 15.0 gal/A by ground sprayers or 5.0 gal/A with aircraft.*

Table 32. Foliar Fungicides[1] (cont.)

Disease	Product and Formulation	Rate of Formulation	Method and Timing of Application	Precautions and Remarks
Sclerotinia blight (*Sclerotinia minor, S. sclerotiorum*)	Omega 500	1.0-1.5 pt	Make first application according to the Sclerotinia advisory program in problem fields or when disease first appears. Up to 2 additional sprays may be required.	Provides good control of Sclerotinia blight and suppression of southern stem rot and Rhizoctonia pod rot.
	Endura 70WG	8.0-10.0 oz	Same as above, except do not apply more than 2 times consecutively.	Also controls web blotch and suppresses leaf spot.
Nematodes, Cylindro-cladium black rot (CBR) (*Cylindro-cladium parasiticum*)	Metam 42% Sectagon 42% Vapam HL 42%	7.5-15.0 gal 7.5-15.0 gal 7.5-15.0 gal	Use with NC 12C or Perry in cases or severe disease pressure; plant other varieties only in cases of light CBR pressure. Apply 8 inches deep at least **14 days preplant** with1 injector shank in front of a bed shaper to mark rows. Do not mix treated soil with untreated soil by tillage or other cultural practices after application.	Apply after soil temperatures exceed 60°F at 4-in depth, and temperatures are likely to be at this level or warmer for 5 days. Delay application if >1 in. of rainfall is forecast in next 72 to 96 hr period.

[1] *All rates are listed as formulated product/A. Read labels and observe all precautions and restrictions on application, pre-harvest interval, and restrictions on feeding treated hay, vines, or hulls to livestock. For best results, apply sprays according to leaf-spot advisory program in a volume of 12.0 to 15.0 gal/A by ground sprayers or 5.0 gal/A with aircraft.*

Table 33. Nematicides

Disease	Product and Formulation	Rate of Formulation	Method and Timing of Application	Precautions and Remarks
Nematodes	Temik 15G	7.0 lb (Note: 5 lb may be sufficient if used in combination with Telone, Vapam, Metam, or Sectagon)	Apply Temik 15G in-furrow for suppression of nematodes and thrips.	Label prohibits the use of hay, vines, or hulls from treated soil as a livestock feed.
	Temik 15G	12.0-20.0 lb	Apply to the seed furrow or apply 12-inch band and incorporate in soil.	Same as above.
	Telone II	3.0-6.0 gal	Apply 8 to 12 inches deep in row and bed soil. Wait 7 to 14 days before planting.	See label for precautions and restrictions.
	Metam 42% Sectagon 42% Vapam HL 42%	7.5 gal 7.5 gal 7.5 gal	Same as above, but wait 14 days before planting.	Same as above.

PEANUT IRRIGATION

B.B. Ross, Extension Agricultural Engineer (Retired)

Although considered to be somewhat drought resistant, peanuts exhibit a variation in drought tolerance depending upon the stage of growth and variety. There are critical times during the growth of the peanut plant that a soil moisture deficit can severely limit yields and/or diminish quality. The table below divides the peanut growing season into four stages and indicates the relative response of the plants to a lack of moisture during each stage.

Response of Peanut Plants to Irrigation at Various Growth Stages

Plant Growth Stage (Duration)	Plant Indicators	Relative Drought Susceptibility
germination (1-2 weeks)	planting to emergence	high
early vegetative growth (5-6 weeks)	emergence to flowering/ pegging	low
nut development/fruiting (8-9 weeks)	flowering/pegging to pod formation	high
maturation (5-6 weeks)	pod formation to harvest	moderate

While adequate moisture during the germination stage is necessary for a good, uniform stand, the mid-season nut development, or fruiting stage, is the most critical time for irrigation if there is a shortage of rainfall. In addition to being the stage in which the peanut plant is most susceptible to drought stress, it is also the stage of maximum water use by the plant.

In Virginia, the critical part of the nut development/fruiting period includes the latter part of July and the month of August. Irrigation in June or earlier is discouraged, unless extremely dry conditions persist, because excess moisture can trigger excessive vine growth. Irrigation of peanuts in September is also not preferred because too much moisture during the plant maturing stage can increase the severity of CBR, Sclerotinia blight, and leaf-spot diseases. Late unnecessary irrigation can also delay maturity and promote the development of small pods. In dry years, irrigation can reduce the threat of Aflatoxin and suppress the outbreak of spider mites.

Irrigation Scheduling Methods

Soil Feel Method

A soil sample should be taken from several sites, representative of the predominant soil type in the field, by digging down to a 6- to 12-inch depth. To evaluate soil moisture, after the sample is taken, it is held in the palm and fingers of the hand and squeezed to form a ball. Based on the appearance of the ball, the following table can be used to estimate plant-available water. The upper end of the ranges given should be used for coarse-textured soils, such as loamy sands, while medium-textured soils, such as sandy loams, apply to the lower end of the ranges.

Estimating Soil Moisture By The Soil Feel Method

Plant-available Water Remaining In Soil	Feel or Appearance at 6-12 Inches
100%	No free water appears on soil, but wet outline of ball is left on hand
75-100%	Forms a ball that breaks easily
50-75%	Forms a weak ball that falls apart
<50%	Appears dry, will not form a ball
0%	Dry, loose, flows through fingers

In deciding whether to irrigate or not, the plant growth stages described earlier should be considered. For the germination and nut development/fruiting stages, soil moisture should not be allowed to drop below the 50 percent to 60 percent plant-available water level, while during the early vegetative growth and maturation stages it could be allowed to drop below the 50 percent level. The amount of irrigation water which should be applied once an irrigator has determined the approximate soil moisture content will be discussed below.

Tensiometer Methods

Tensiometers are well-suited to the light, sandy soils found in southeast Virginia. Depending upon the size of the irrigated field and the variability in soil textures, one or more tensiometer stations should be installed. A station consists of 2 tensiometers, 1 inserted to a 12-inch depth and the other at 24 inches. The shallow instrument reflects the need for irrigation while the deep one provides an indication of whether or not irrigation amounts have been adequate. If the deep tensiometer continues to dry during the season while irrigation is continuing, it indicates that insufficient irrigation water is being applied. Manufacturers' recommendations should be closely followed regarding installation and interpretation of tensiometer readings.

The following table relates tensiometer gauge vacuum reading to approximate soil moisture content. In the case of soil tension, readings differ according to soil texture.

Soil Water Availability at Various Tensiometer Readings

Irrigation Trigger Point		Tensiometer Reading (Centibars)	
Peanut Plant Growth Stage	**Plant-available Water Remaining in Soil (%)**	**Sandy loam**	**Loamy sand**
germination	60	40	20
early veg. growth	40	60	40
nut devel./fruiting	60	40	20
maturation	40	60	40

Electrical Resistance Methods

A gypsum soil block is an “electrical resistance” device which uses gypsum as a porous material in which electrodes are embedded. Electrical resistance between the electrodes varies with soil water content. Gypsum has a characteristic much like a very heavy clay with small pores. Gypsum blocks, therefore, are not recommended for the light, sandy soils of southeast Virginia.

Another electrical resistance type sensor that has been developed in recent years is called the Watermark sensor. As with the gypsum block, the sensor’s resistance varies with the electrical conductivity of solution between the electrodes. Pore sizes in this matrix are larger than those of the gypsum block, thereby making it more suitable for coarse-textured soils. Unlike gypsum blocks, Watermark sensors may be reused year after year.

Watermark sensors (and gypsum blocks) come with a meter that is attached to the terminals. Some meters give an instant reading of soil water tension while others provide a digital readout which can be converted to tension using a simple chart. Irrigation should occur when sensor readings exceed a set tension level as with tensiometers. Follow manufacturer’s recommendations carefully when using this method.

How Much Irrigation?

In peanut irrigation, it may be advisable to bring soil moisture back up to only 85 percent to 90 percent of plant available water-holding capacity in the event that rainfall occurs shortly thereafter. This will allow the soil to accommodate part of the rainfall and may help to reduce associated disease incidence.

The amount of water to apply depends on soil texture, root zone depth, and the plant-available water level when irrigation is begun as well as the sprinkler irrigation efficiency. The following table provides irrigation estimates considering these factors for two soil textures.

Maximum Water Application at Various Growth Stages, Soil Moisture Levels, and Soil Textures

Peanut Plant Growth Stage	Plant-available Water Remaining in Soil (%)	Maximum Amount of Irrigation Water to Apply (Inches)	
		Sandy Loam	Loamy Sand
germination	60	0.33-0.50	0.25-0.33
early veg. growth	40	2.00-2.25	1.25-1.50
nut devel./fruiting	60	1.25-1.50	0.75-1.00
maturation	40	2.00-2.25	1.25-1.50

To determine if these applications are adequate, an irrigator can evaluate the deep tensiometer readings or examine deep soil samples by the soil feel method.

SPRAYER INFORMATION

Information on Spray Tips for Herbicides

Tip No. 8004 is recommended for application of preplant and at-cracking herbicides.

Flat Fan Spray Tip No.	Liquid Pressure in psi (at tip)	Gallons Per Acre[1]		
		3 MPH	4 MPH	5 MPH
8004[2] (50-mesh screen)	20	28	21	17
	25	31	24	19
	30	34	26	21
	40	40	30	24

[1] *Values are based on a nozzle spacing of 18 inches.*

[2] *or equivalent.*

Information on Spray Tips for Soil Fungicides

Tip numbers 8008 LP, 8010 LP, TK 7.5, and TK 10 are recommended for application of soil fungicides (i.e., Terraclor 75W, Rovral 4F, Vitavax 3F). Center each nozzle directly over the row, and calibrate to deliver 40 gal of spray per acre.

Flat Fan Spray Tip No	Liquid Pressure in psi (at tip)	Gallons Per Acre[1]		
		3 MPH	4 MPH	5 MPH
8008 LP (no strainer)	10	36	27	21
	15	44	33	26
	20	51	38	30
	30	61	45	36
8010 LP (no strainer)	10	45	34	27
	15	55	41	33
	20	66	50	40
	30	77	58	46
TK 7.5 (no strainer)	10	41	31	24
	15	51	38	30
	20	61	43	36
	30	72	53	43
TK 10 (no strainer)	10	55	41	33
	15	66	50	40
	20	77	58	46

[1] *Values are based on a nozzle spacing of 36 inches.*

Information on Spray Tips for Leaf-Spot Fungicides

Orfice disc number D_2 or D_3 and core number 13 or 23 are routinely used to spray leaf-spot fungicides. Three nozzles per row, a minimum of 50 lb spray pressure, and a spray volume of 15 gal/A are recommended.

Combination Disc and Core No.	Liquid Pressure (at tip) (psi)	Gallons Per Acre - 36" Row Spacing Using 3 Nozzles Per Row		
		3 MPH	4 MPH	5 MPH
D_2-13	40	13.1	9.8	7.9
	60	16.4	12.3	9.9
	80	18.1	13.7	10.9
D_2-23	40	16.5	12.3	9.9
	60	20.5	15.4	12.3
	80	23.3	17.3	13.9
D_3-23	40	19.4	15.5	11.7
	60	23.3	17.3	13.9
	80	26.6	19.8	16.0

NOTE: Consult a commercial spray guide and/or your Extension agent for selection of suitable tips to achieve special low- or high-volume spray needs.

Travel Speed Chart

Miles per hour	Time required to travel[1]		
	88 feet	176 feet	352 feet
1	1 minute	2 minutes	4 minutes
2	30 seconds	1 minute	2 minutes
3	20 seconds	40 seconds	1 minute 20 seconds
4	15 seconds	30 seconds	1 minute
5		24 seconds	48 seconds
6			40 seconds
7			34 seconds

[1] *1 MPH = 88 feet per minute; 1 MPH = 1.466 feet per second*

Measure Equivalency Tables

Land Measure

16.5 feet	=	5.5 yards OR 1 rod
66 feet	=	4 rods OR 1 chain
272.25 square feet	=	30.25 square yards OR 1 square rod
4,356 square feet	=	16 square rods OR 1 square chain
43,560 square feet	=	160 square rods OR 10 square chains OR 1 acre

Length of Row Required for One Acre

Row spacing	Length or distance
24 inches	7260 yards = 21,780 feet
30 inches	5808 yards = 17,424 feet
32 inches	5445 yards = 16,335 feet
34 inches	5125 yards = 15,374 feet
36 inches	4840 yards = 14,520 feet
38 inches	4585 yards = 13,756 feet
40 inches	4356 yards = 13068 feet

Measurement Equivalency Chart

A teaspoon or tablespoon throughout this table refers to a level, standard measuring teaspoon or tablespoon.

80 drops	=	1	teaspoon or about 1/6 fluid ounce
	=	5	milliliters or cubic centimeters (cc)
1 tablespoon	=	3	teaspoons
		15	milliliters (ml) or cubic centimeters (cc)
		1/2	fluid ounce
1 cup	=	16	tablespoons
		8	fluid ounces
		236.6	milliliters (ml) or cubic centimeters (cc)
		1/2	pint
1 pint	=	16	fluid ounces (NOTE: 1 pint or quart dry measure is about 16 percent larger than 1 pint or 1 quart liquid measure.)
		473.2	milliliters (ml) or cubic centimeters (cc)
1 fluid ounce	=	2	tablespoons or 29.6 milliliters (ml) or cubic centimeters (cc)
1 U.S. gallon	=	4	quarts
		8	pints
		3,785	milliliters (ml) or cubic centimeters (cc)
		8.3	pounds (lb) water
1 milliliter	=	1	cubic centimeter (cc)
	=	0.2	teaspoon
1 liter	=	1,000	milliliters (ml) or cubic centimeters (cc)
		1.08	quarts (1 quart + 1 fluid ounce)
1 pound	=	16	ounces
		453.59	grams
1 kilogram	=	1,000	grams, approximately 2 pounds 3 ounces
1 ounce	=	28.4	grams
1 bushel of soil	=	1.25	cubic feet
1 mile	=	5,280	feet
		320	rods
		1,609.4	meters
1 acre	=	43,560	square feet
		160	square rods
		0.4047	hectare
10 millimeters (mm)	=	1	centimeter (cm)
		0.3937	inch
100 centimeters	=	1	meter (m)
		39.37	inches

ESTIMATED CROP PRODUCTION COSTS

Mike Roberts, Southeast District Farm Management Agent

Based on 3,000 pound per acre yield.

Variable Costs	**Costs Per Acre - Your Farm**
Seed	
Fertilizer, Lime, Landplaster	
Chemicals	
Machinery	
Miscellaneous	
Interest	
Total Variable Costs	
Fixed Costs	
Machinery	
Labor	
Total Fixed Costs	
Total Costs (excluding land)	

Notes:

1. Costs per acre for producing peanuts will vary from farm to farm depending in many factors. Calculating your actual costs is important. Typical production costs in Virginia range from $500- $600+ per acre. This worksheet is provided for you to calculate your costs and returns in order to evaluate the peanut enterprise as a profit center for your farm.
2. The Farm Business Management agent is available to assist you. Contact Mike Roberts at (803) 733-2686 or mrob@vt.edu.
3. You may also use this guide as a template for notes during the Extension Peanut production meetings.

PEANUT PRODUCTION CAN BE PROFITABLE

James W. Pease, Associate Professor of Agricultural Economics

To determine whether the peanut enterprise is profitable for your farm, use the total cost of production that was obtained from your budget and consider all of the following information. Look at the accompanying graph which illustrates the yield per acre that a peanut producer must produce in order to break even. This graph plots varying peanut prices on the horizontal axis versus the producer's total cost of production per acre on the vertical axis. The break-even yield is calculated by dividing the total cost of production per acre by the peanut price and multiplying the result by 2000 lbs/ton. For example, a producer with total cost of production of $500/acre and faced with the prospect of receiving only $355/ton for peanut sales would need to average 2,817 pounds per acre over the whole farm in order to break even producing peanuts. Anything over that break-even yield is going to allow for profit. As can be seen from the graph, receipt of higher prices lowers the break-even yield and increases the potential for profit. Important factors to consider are:

1) Do you know your total costs of production, including both variable and fixed costs?

2) How certain can you be about the sales price that you will obtain for peanuts (including discounts and premiums)?

3) What is the likely average yield of peanuts across all acres planted (not just the best) on your farm?

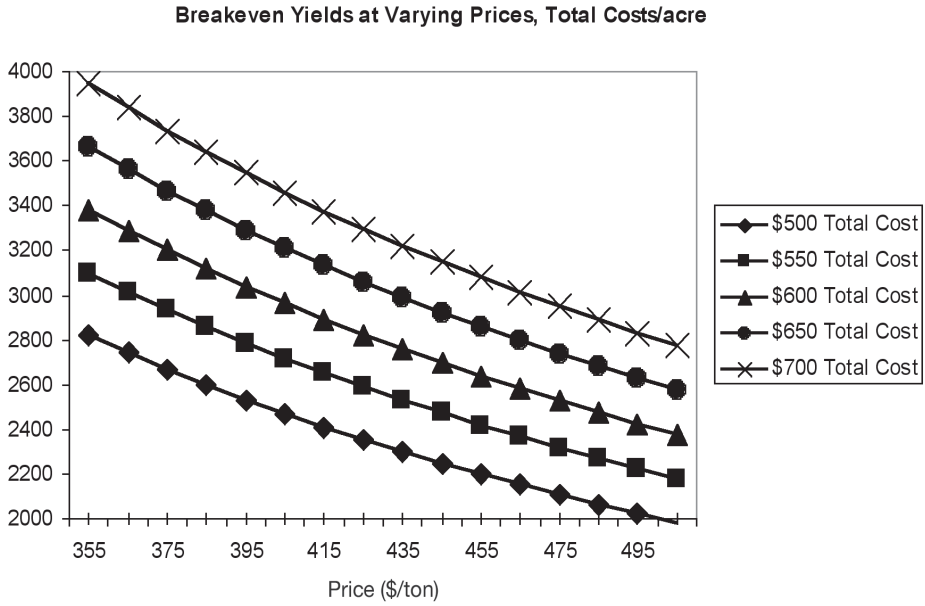

Table 34. Break-Even Yields for a Given Price per Ton

Total cost/A	Price ($/ton)															
	355	365	375	385	395	405	415	425	435	445	455	465	475	485	495	505
$500	2,817	2,740	2,667	2,597	2,532	2,469	2,410	2,353	2,299	2,247	2,198	2,151	2,105	2,062	2,020	1,980
$550	3,099	3,014	2,933	2,857	2,785	2,716	2,651	2,588	2,529	2,472	2,418	2,366	2,316	2,268	2,222	2,178
$600	3,380	3,288	3,200	3,117	3,038	2,963	2,892	2,824	2,759	2,697	2,637	2,581	2,526	2,474	2,424	2,376
$650	3,662	3,562	3,467	3,377	3,291	3,210	3,133	3,059	2,989	2,921	2,857	2,796	2,737	2,680	2,626	2,574
$700	3,944	3,836	3,733	3,636	3,544	3,457	3,373	3,294	3,218	3,146	3,077	3,011	2,947	2,887	2,828	2,772

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The printing of this publication was funded by the Virginia Peanut Growers Association.

REVISED 2007 Publication 432-101

Produced by Communications and Marketing, College of Agriculture and Life Sciences,
Virginia Polytechnic Institute and State University

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VT/019/0107/500/271496/432101