

Tobacco

Charles S. Johnson, Extension Specialist, Southern Piedmont AREC

Soil Texture

Herbicide performance and safety are highly influenced by soil texture and organic matter content. Herbicide rates are usually higher for fine versus coarse soil textures and with increasing percentages of organic matter content. In general, high herbicide rates may be necessary for fine-textured soils with at least 1% to 2% organic matter. Use the low recommended herbicide rate when soil organic matter is less than 1%, regardless of soil texture. Soil textures are described in herbicide recommendations as:

Coarse - Sands; loamy sands; sandy loams

Medium - Sandy clay loams; loams; silt loams; silts

Fine - Clay loam; silty clay loams; clays

Soil Preparation

All weed growth and crop stubble must be thoroughly worked into the soil prior to application of most herbicides used in tobacco fields. The soil should be moist and loose with all clods broken down.

Spray Equipment

ALWAYS clean, check, and calibrate sprayers before use to ensure correct herbicide spray volume and uniform spray pattern. Apply liquid and wettable powder herbicide formulations in 20 to 40 gallons of water per acre using a standard low-pressure (25 to 50 psi) boom sprayer. Poast must be applied in 5 to 20 gallons of water per acre at 40 to 60 psi using hollow-cone or flat-fan nozzles. Maintain continuous agitation, and never leave a spray mixture in the tank overnight.

Preplant Incorporated (PPI)

Apply herbicides in an even broadcast application before planting. **Avoid spray overlap.** Use boom sprayer equipped with fan-type nozzles (8004, etc.), flood-jet nozzles (TK4, etc.), or raindrop nozzles. Incorporate herbicide immediately after application (see label) with the following:

1. **Disc** (Combination, tandem, double-disc, disk harrow, or similar equipment) - Set to cut 4 to 6 inches deep and operate in two different directions (at right angles to each other) at 4 to 6 mph. A disc set to cut 4 to 6 inches will incorporate herbicide in the top 1 to 2 inches of soil.

Precautions - Avoid use of a large field disc. Discs should be set no more than 8 inches apart and be no wider than 24 inches in diameter. **A single cultivation does not adequately incorporate herbicides, and may increase crop injury and decrease weed control.** Incorporation with implements set to cut less than 2 inches deep may result in erratic weed control. Using incorporation equipment and tractor speeds not listed on the label may result in poor or erratic weed control and/or crop injury.

2. **PTO-driven equipment** (tillers, cultivators, hoes) - Set to cut 3 to 4 inches deep and operate one time at 4 mph. This type of equipment performs best on coarse soil types. PTO-driven equipment should not be operated at a speed greater than 4 mph.
3. Other equipment can be used, but proper procedures should be followed. Read labels or manufacturer's directions.

Overtop after Transplanting

Herbicides labeled for this use can be sprayed, either in a band or broadcast, onto freshly prepared soil within 7 days of transplanting. Cultivation is required, immediately before or at time of application, if the application is made more than 2 days after transplanting or if significant rain has fallen since transplanting.

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1. **Band application** - Apply herbicide in a 14 to 24-inch band over the row using fan-type, even-spray nozzles (8004E, etc.). Refer to label and product information for information on this type of application. The amount of herbicide required per crop acre is reduced with band application and can be determined by the following formula: **Banded product rate/acre = Band width (inches)/Row spacing (inches) x Broadcast product rate.**
2. **Broadcast** - Apply herbicide in an even broadcast application with a sprayer equipped with fan-type nozzles (8004, etc.).

Layby

Labeled herbicides can be applied as a directed spray to row middles immediately after the last normal cultivation, which should leave the row middles weed-free. Application should be made using commercially available drop nozzles equipped with flood-jet flat (TK2, TK4, etc.) or even flat-fan (8004E, etc.) nozzles in order to spray a 16- to 30-inch band between rows. In fields where the spray boom passes over the same row middle twice, use nozzles which apply one-half the normal number of gallons per acre to prevent over-application. Use the following formula to determine the amount of product to use with band application: **Product/acre for band treatment = Band width (inches)/Row spacing (inches) x Broadcast rate of product/A.** One-half inch of water is usually necessary within 7 to 10 days after application for herbicide activation.

No-till

Aim may be used as a pretransplant burndown treatment. Command 3ME and Devrinol DF may be applied at transplanting. Irrigation or rainfall may be needed to wash Devrinol off mulch and onto the soil surface.

Weeds

A herbicide should be selected based on the most important weeds in each field. The majority of the herbicides used in tobacco will control grasses and a limited number of broadleaf weeds.

Relative Effectiveness of Herbicides for Tobacco

Table 5.63 - Grasses and Nutsedge¹

	Barnyardgrass	Bermudagrass	Broadleaf Signalgrass	Crabgrass	Crowfoot grass	Fall Panicum
Command	E	P-F	E	E	E	E
Devrinol	G	P	F	E	E	G
Poast	F-G	G	E	G	F	E
Prowl or Pendimax	G	P	G	E	E	G
Spartan	F	P	P	F	F	F
Tillam	G	P	P	E	E	G

	Foxtails	Goosegrass	Johnsongrass (seedling)	Texas Panicum	Nutsedge
Command	E	E	G	G	P
Devrinol	E	E	F	-	N
Poast	E	G	E	E	N
Prowl or Pendimax	E	E	G	G	N
Spartan	F	F	F	F	E
Tillam	E	G	G	P	G

¹E = 90 to 100% control; G = 75 to 90%; F = 50 to 75%; P = Less than 50%; N = no control. This table gives general ratings of relative herbicidal activity. Activity varies with weather conditions, soil type, and application method. Under non-optimal conditions, activity may be less than indicated.

Table 5.64 - Broadleaf Weeds¹

	Carpetweed	Cocklebur	Galinsoga	Jimsonweed	Lambsquarters	Morningglory
Command	P	F	P-F	G	G	P
Devrinol	G	P	P-F	P	G	P
Poast	N	N	N	N	N	N
Prowl	G	P	P	P	G	P
Spartan	G	F-G	F	F-G	G	G
Tillam	G	P	P	P	G	P
	Pigweed	Purslane	Prickly sida	Ragweed	Sicklepod	Smartweed
Command	P	G	E	F-G	P	G
Devrinol	G	G	P	F	P	P
Poast	N	N	N	N	N	N
Prowl	G	G	P	P	P	P
Spartan	G	G	P	P	P	G
Tillam	G	G	P	P	P	P

¹E = 90 to 100% control; G = 75 to 90%; F = 50 to 75%; P = Less than 50%; N = no control. This table gives general ratings of relative herbicidal activity. Activity varies with weather conditions, soil type, and application method. Under non-optimal conditions, activity may be less than indicated.

Effect of PPI Applications on Early-season Growth of Tobacco

Herbicides applied preplant may temporarily delay plant growth during the first month after transplanting. Application factors which enhance root injury are: 1) improper herbicide incorporation; 2) wrong herbicide rates for soil texture; 3) poor application techniques and equipment. If all procedures for preplant application of a herbicide are followed, the delay in plant growth should be minimal, and under favorable growing conditions should have no effect on plant vigor or yields. However, the delay in plant growth may be increased by unfavorable growing conditions and other causes. Application of a herbicide at transplanting and/or after the last cultivation will eliminate delays in plant growth caused by PPI herbicide use.

Effect of Herbicide on Small Grain Crops

Residues of some tobacco herbicides, especially Command and Devrinol applied PPI, may affect the growth of small grain crops following tobacco (as indicated on product labels). If the small grain is grown only as a cover crop, the problem may not be considered serious. The potential for carry-over can be reduced by: 1) using minimum labeled rates of the chemicals; 2) band applications of labeled products at transplanting and/or at layby; 3) early stalk and root destruction; 4) deep plowing before seeding of small grain.

Table 5.65 - Field-grown Tobacco

Weed problem	Soil ¹ Texture	Chemical; lbs Active Ingredient/A	Product; Rate/A	Application ² Method	Remarks
Pigweed, lambsquarters, nightshade, purslane, smartweed, velvetleaf, spurred anoda, carpetweed, cocklebur, cotton, groundcherry, morningglory, common ragweed		carfentrazone	Aim 0.8-1.5 oz Aim EC or Aim EW 0.8-1.5 fl oz.	Burndown, shielded, directed	The pretransplant interval is 1 day; the preharvest interval is 6 days. No more than 2 oz Aim or 3 fl oz Aim EC or EW may be applied per season. Read precautionary statements.
Barnyardgrass, broadleaf signalgrass, crabgrass, field sandbur (suppression), foxtails, seedling johnsongrass, lambsquarters, fall panicum, velvetleaf, jimsonweed, prickly sida, purslane, spurred anoda, venice mallow, common ragweed, smartweed, cocklebur (suppression), shattercane	Coarse Fine	clomazone 0.75 1.0	Command 3ME 2.0 pt 2.7 pt	PPI, OT	Use the higher rate for heavy weed pressure or heavy soils. Best results are obtained when the product is incorporated no more than 1 inch deep. Transplants should be planted so that roots are below the treated area. OT applications must be made within 7 days of transplanting. Read precautionary statements.

¹ When the soil type has less than 1% organic matter, use the rate for the coarse soil texture recommendations. **Coarse** - Sands; loamy sands; sandy loams. **Medium** - Sandy clay loams; loams; silt loams. **Fine** - Clay loam, silty clay loam; clays.

² PPI - Preplant incorporated. Delay in growth may result under adverse weather conditions and/or when poor application practices have been used. OT - Overtop after transplanting as a band or broadcast applications. Layby - Application of herbicide in row middle after last cultivation. Burndown, shielded, directed - broadcast spray before transplanting (burndown), or shielded/hooded spray to row middles only (shielded), or spray directed toward row middles and surface of row beds after sequential harvesting of flue-cured tobacco has removed sufficient leaves that the spray will not contact remaining crop leaves (directed).

Table 5.65 - Field-grown Tobacco (cont.)

Weed problem	Soil ¹ Texture	Chemical; lbs Active Ingredient/A	Product; Rate/A	Application ² Method	Remarks	
Barnyardgrass, carpetweed, crabgrass, fall panicum, foxtails, goosegrass, johnsongrass from seed, lambsquarters, pigweed, common purslane, ragweed (suppression), ryegrass, check label for uncommon weeds		napropamide	Devrinol 2EC	PPI only	Incorporate the same day as applied. Small grain injury may result from PPI application. Use high rate for burley in southwest Virginia. Read precautionary statements.	
	Coarse	1.0	2.0 qt			
	Medium	1.0-1.5	3.0 qt			
	Fine	2.0	4.0 qt			
				Devrinol 50-DF		PPI, OT, Layby
		Coarse	1.0	2.0 lb		
	Medium	1.0-1.5	2.0-3.0 lb			
	Fine	2.0	4.0 lb			
Grass weeds and Volunteer small grain	All types	sethoxydim	Poast	post-emergence	Apply to actively growing grasses at 40-60 psi in 5-` 20 gal/A through hollow cone or flat-fan nozzles. May be banded or applied broadcast. Do not apply more than 4 pt/A/season. Read precautionary statements.	
	Single use:	0.28	1.5 pt + 2.0 pt oil concentrate			
	Sequential use:	0.19	1.0 pt + 2.0 pt oil concentrate			
Annual spurge, barnyardgrass, carpetweed, crabgrass, crowfootgrass, Florida pusley, foxtails, goosegrass, johnsongrass from seed, lambsquarters, panicums, pigweed, purslane, signalgrass, check label for uncommon weeds.		pendimethalin	Prowl 3.3EC or Pendimax 3.3		Use on transplanted tobacco. Apply up to 60 days prior to transplanting; incorporate within 7 days after application. Use high rate for silt and silt-loam soils. May also be applied in a band in row middles at layby. Read precautionary statements.	
	Coarse	0.74-0.99	1.8-2.4 pt	PPI only		
	Medium	0.74-1.24	1.8-3.0 pt			
	Fine	0.99-1.24	2.4-3.0 pt			
	Coarse	0.50-0.74	1.2-1.8 pt	Layby only		
	Medium	0.74-0.99	1.8-2.4 pt			
	Fine	0.74-0.99	1.8-2.4 pt			
				Prowl H ₂ O		
	Coarse	0.95	2.0 pt	PPI only		
	Medium	0.95-1.19	2.0-2.5 pt			
	Fine	1.19	2.5 pt			
	Coarse	0.71	1.5 pt	Layby only		
	Medium	0.95	2.0 pt			
	Fine	0.95	2.0 pt			

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Table 5.65 - Field-grown Tobacco (cont.)

Weed problem	Soil ¹ Texture	Chemical; lbs Active Ingredient/A	Product; Rate/A	Application ² Method	Remarks
Cocklebur, Florida pusley, hairy galin- soga, goosegrass, groundcherry, jim- sonweed, seed- ling Johnsongrass, lambsquarters, morning-glory, wild mustard, night- shade, nutsedge, orchardgrass, pigweed, prickly sida, Suppresses , barnyardgrass, crabgrass, crow- footgrass, foxtail, panicums, signal- grass, check label for uncommon weeds	Coarse Medium Fine	sulfentrazone 0.25 0.31 0.38	Spartan 4F 8 fl oz (0.50 pt) 10 fl oz (0.62 pt) 12 fl oz (0.75 pt)	After bed- ding, before transplanting	Apply to soil sur- face after field has been pre- pared for planting. Apply within 14 days of trans- planting. Where raised beds are used, apply after beds are knocked down for plant- ing. If soil must be worked after application, do not disturb soil below a 2 inch depth. Do not apply at or after transplanting. Read precaution- ary statements.

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Precautionary and Restriction Statements

Read all directions, cautions, precautions, and special precautions on each product label.

Aim; Aim EC, EW (carfentrazone)

As a contact burndown herbicide for broadleaf weeds, Aim may be applied (1) to kill cover crops prior to no-till transplanting, (2) as a shielded or hooded spray to row middles before layby, or (3) as a directed spray following first harvest of flue-cured tobacco. Spray solution will cause extensive burn to broadleaf plants (and tobacco leaves) on contact.

Command 3ME (clomazone)

Apply only as specified on the label. Command may be tank mixed with other EPA-registered tobacco herbicides and can be impregnated on dry bulk fertilizer. Bottom leaves of tobacco plants in treated soil may whiten or yellow temporarily, but the crop should grow out of this with no adverse effect on yield or quality. Avoid spraying Command within 300 feet of susceptible and desirable plant species, as spray drift can cause foliar whitening or yellowing of some plants. Do not apply Command within 1,200 feet of residences, towns, subdivisions, or commercial vegetable or fruit nurseries or greenhouses. Small grains should not be planted in the fall or following spring after product use.

Devrinol 50DF, 2E (napropamide)

Do not apply more than a total of 2 lb of active ingredient per acre in any one season. After harvest or prior to planting succeeding crops, deep moldboard or disk plowing operation must be carried out. Do not seed to alfalfa, small grain, sorghum, or corn for 12 months after Devrinol application. Injury to rotational crops is lessened by band versus broadcast application. When Devrinol is applied after transplanting or at layby, rainfall or overhead irrigation following application improves weed control.

Tillam 6E (pebulate)

Applied according to directions and under normal growing conditions, Tillam will not harm the treated crop. Read label directions when used in combination with fertilizers or other pesticides.

Poast (sethoxydim)

When mixing Poast, fill sprayer 1/2-2/3 full of water. Add oil concentrate (preferably highly refined vegetable oil) first with agitation. Add Poast last with remaining volume of water, also with agitation. Agitation must be maintained during application. Do not apply Poast (1) at rates above 1.5 pt/A in the field; (2) to exceed 4 pt/A/season; (3) when grasses are under stress; (4) if rainfall is expected within 1 hour; (5) with any other pesticide, additive, or fertilizer except as specified on the Poast label; (6) through any type of irrigation system; (7) within 42 days of harvest.

Prowl 3.3EC, Pendimax 3.3, and Prowl H2O (pendimethalin)

Applied according to directions and under normal growing conditions, pendimethalin should not harm transplanted tobacco, but can temporarily retard growth under stressful conditions (cold/wet or hot/dry weather). *Layby applications should be made as a directed spray in a 16- to 24-inch band centered between rows. Broadcast rates for layby applications must be adjusted based on the width of the intended spray band and soil texture.* Any spray contacting tobacco leaves may cause deformations. Crop injury may result if winter wheat and winter barley are planted in the fall (after a spring application) when no-till planting procedures are used. Do not feed forage or graze livestock for 75 days after planting wheat or barley in treated land.

Spartan 4F (sulfentrazone)

Do not use in tobacco greenhouses. Do not inpregnate on fertilizer. Do not apply after transplanting. Do not apply to soils classified as sands with less than 1 percent organic matter and shallow groundwater. *Most tobacco fields in Virginia contain coarse to medium textured soils. The 8 to 10 fl oz per acre rates are appropriate for these conditions. Crop injury can occur when incorporation is poor, transplants are set too shallow, or heavy rain falls near transplanting.* Splashing of treated soil onto young tobacco can also cause localized burning. Do not apply Spartan more than once, per site, per season. Do not seed small grains within 4 months of application. Do not plant cotton or canola with 18 months of use.