INSECT CONTROL IN TOBACCO TRANSPLANTS GROWN IN GREENHOUSES

J. Michael Moore, Extension Agronomist—Tobacco

INSECT	MOA	CHEMICAL	RATE PER 100 SQ YD	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Aphids, cutworms, or flea beetles	1B	*acephate* Acephate 97 and Orthene 97	0.75 Tbsp in 3 gal water	24 H/ 3 D	Apply to foliage as a spray. Do not apply through an irrigation system. Over application can cause plant injury.
Aphids or flea beetles	4A	*imidacloprid* Admire Pro 4.6 Alias and others 2F	0.45–0.6 oz/1000 plants 1–1.4 oz/1000 plants	12 H/ 14 D	To control aphids or flea beetles in the field, apply as a drench to trays or flats not more than 7 days prior to transplanting. Water in immediately, using sufficient water volumes to remove any white residue from foliage.
	4A	*thiamethoxam* Platinum SC Platinum 75 SG	0.83 oz/1000 plants 0.27 fl oz/1000 plants	12 H/ 14 D	
Slugs and snails	5B	*metaldehyde* Deadline Bullets	1 lb/1,100–3,600 sq ft	12 H/ Day of harvest	Apply to margins, walkways, and vacant areas at dusk. Do not apply to float water or directly to plants.
	5B	*iron phosphate* Sluggo	0.54–1 lb	0	Do not put bait on plants. Organically acceptable.
Mole crickets or wireworms	4A	*imidacloprid* Admire Pro 4.6 Alias and others 2F	0.6–1.2 oz/1000 plants 1.4–2.8 oz/1000 plants	12 H/ 14 D	To control mole crickets or wireworms in the field, apply as a drench to trays or flats prior to transplanting. Water in immediately, using sufficient water volumes to remove any white residue from foliage. To control wireworms in the field, apply as a drench to trays or flats prior to transplanting.
Wireworms (only)	4A	*thiamethoxam* Platinum and T-Moxx 2S	1.3 oz/1000 plants	12 H/ 14 D	

TOBACCO GREENHOUSE TRAY SANITATION

J. Michael Moore, Extension Agronomist—Tobacco

DISEASE	MOA	CHEMICAL	RATE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Rhizoctonia, Sclerotinia, and Pythium	8A	*methyl bromide* 98%	3 lb/1,000 cu ft	24 H/ 3 D	Stack polystyrene trays loosely with sticks separating trays after every 10 trays in the stack to improve movement of the gas into the trays. Release gas into and maintain a closed environment (plastic tarp or other container) for at least 72 hours when air temperature is at least 50° F. Greenhouses should not be used as fumigation chambers as they cannot be properly sealed. Trays should be ventilated prior to filling with media. Proper precautions should be taken to avoid worker injury from remaining gas when the cover is opened.
Rhizoctonia, Sclerotinia, and Pythium		Steam	175°F for 30 minutes		Excessive heat for an extended period of time can cause trays to be brittle and warped resulting in problems during mechanical seeding.

TOBACCO GREENHOUSE DISEASE CONTROL

Paul Bertrand, Extension Plant Pathologist
J. Michael Moore, Extension Agronomist

DISEASE	MOA	CHEMICAL	RATE/1000 SQ FT	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Blue Mold, Rhizoctonia (Damping Off & Target Spot)	M3	*mancozeb* Dithane Rainshield Manzate Pro Stick Penncozeb 75DF	0.5 lb (1 level tsp/gal)	24 H/ 21 D	Use 0.5 lb/100 gal of water. Spray to run-off (3 gal/1000 sq ft) every 5–7 days when plants reach dime size (0.5–1" tall). Gradually increase the spray volume to 6–12 gal/1000 sq ft as plants enlarge until transplanting to the field.
	11	*azoxystrobin* Quadris F	0.14 oz (4 ml)	12 H/ 100 D	This application is allowed by GA 24c Labeling. Apply in enough water for thorough coverage (5 gal/1000 sq ft). Make only 1 application prior to transplanting. Additional field applications may be made according to the Quadris federal label.
Pythium	14	*etridiazole* Terramaster 4 EC	1 fl oz	12 H/ 3 D	Mix Terramaster per 100 gal of water 2–3 weeks after seeding and again up to 8 weeks after seeding as needed. Mix Terramaster with water in a bucket and add to float water while providing thorough mixing. A sequential application may be made 3 weeks after the initial application as needed.
If Pythium shows up, a second treatment can be made up until 8 weeks after seedling. The plant producer assumes all responsibility for any stunting or plant injury that may occur.					

TOBACCO FIELD INSECT CONTROL

J. Michael Moore, Extension Agronomist—Tobacco

INSECT	MOA	CHEMICAL	RATE PER ACRE	POUNDS ACTIVE INGREDIENT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Aphids	1B	*acephate* Acephate 97 and Orthene 97	8–12 oz	0.5–0.73	24 H/ 3 D	Good coverage is essential for control for all products. The use of drop nozzles will improve control by depositing insecticides on the underside of the leaves where aphids feed. Do not apply *bifenthrin* later than layby and do not apply more than 0.2 lb ai/A/season. See Tobacco Field Disease Control Section for recommendations to suppress tomato spotted wilt virus with *imidacloprid* as a tray drench in the greenhouse.
	4A	*acetamiprid* Assail 30SG	1.5–4 oz	0.028–0.075	12 H/ 7 D	
	3	*bifenthrin* Brigade 2EC Capture LFR	2.56–6.4 oz 3.4–6.8 oz	0.04–0.10	12 H/ Do Not Apply After Layby	
	4A/ NC	*imidacloprid* Admire Pro Generic products 2F	0.7–1.4 oz 1.6–3.2 oz	0.025–0.05	12 H/ 14 D	
	9B	*pymetrozine* Fulfill 50WG	2.75 oz	0.09	12 H/ 14 D	
	4A	*thiamethoxam* Actara 25WG	2–3 oz	0.03–0.05	12 H/ 14 D	
Aphids (transplant water treatment)	4A/ NC	*imidacloprid* Admire Pro 4.6 Alias and others 2F	0.45–0.6 oz/1000 plants 1–1.4 oz/1000 plants	0.016–0.02/1000 plants 0.01–0.02/1000 plants	12 H/ 14 D	Apply in transplant water. Mix thoroughly. Use 100+ gal of water/A for optimum control. See Tobacco Field Disease Control Section for recommendations to suppress tomato spotted wilt virus with *imidacloprid* as a transplant water application.
	4A	*thiamethoxam* Platinum SC	0.8–1.4 oz/1000 plants	0.013–0.022/1000 plants	12 H/ None given	
	1B	*acephate* Acephate 97	8–12 oz	0.5–0.73	24 H/ 3 D	
Budworms	1B	*acephate* Acephate 97	8–12 oz	0.5–0.73	24 H/ 3 D	**Foliar Application:** Use 8–10 gal of spray/A, using 1 hollow-cone nozzle per row when tobacco is less than 12–14" high. For the remainder of the season, apply 20–40 gal of spray using 3 hollow cone nozzles per row. Operate equipment at 60 lb pressure and do not exceed 4 miles per hour. Apply uniformly in the root zone or poor performance will occur. Coragen is labeled for a Transplant Water Treatment (TPW) to give systemic control of all worms (TBW, THW, Cutworms) Apply in 110 gal of transplant water/A. Maintain soil moisture conditions to improve Coragen uptake by the plants and improve worm control and longevity. Control may often be expected to extend 49 days after transplanting. Coragen is also labeled for Field Foliar Application with the instructions for foliar application above.
	28	*chlorantraniliprole* Coragen 1.67 TPW Coragen 1.67 Foliar	5–7.0 oz 3.5–7.5 oz	0.065–0.098	4 H/ 1 D	
	6	*emamectin benzoate* Denim 16EC	8–12 oz	0.01–0.015	12 H/ 14 D	

INSECT	MOA	CHEMICAL	RATE PER ACRE	POUNDS ACTIVE INGREDIENT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Budworms (*continued*)	5	*spinosad* Blackhawk	1.6–3.2 oz	0.044–0.09	4 H/ 3 D	For best results apply when worms are very small (less than ¼" long). Bt must be eaten by the insect to be effective. Worms will die several days after feeding.
	11	*Bacillus thuringiensis* Dipel 10G Dipel DF Agree S Biobit HP Condor OF Crymax WDG Javelin WG Deliver Lepinox WDG	 5–10 lb 0.5–1 lb 1–2 lb 1 lb 1.6 qt 1–1.5 lb 1–1.25 lb 1.25 lb 1–2 lb		/0 D 4 H/ 4 H/ 4 H/ 4 H/ 4 H/ 4 H/ 4 H/ 4 H/ 12 H	
	28	*cyantraniliprole* Verimark (tray drench)	10–13.5 oz	0.13–0.176	4 H / NA	Apply as a transplant tray drench no earlier than 72 hours prior to planting in the field. Do not apply a total of more than 0.4 lb ai/A of CYAZYPYR® or *cyantraniliprole* containing products per calendar year whether applications are made to the soil or foliarly.
	28	*cyantraniliprole* Exirel (foliar spray)	10–20.5 oz	0.065–0.133	12 H / 7 D	Apply as a foliar spray in the field. Do not apply a total of more than 0.4 lb ai/A of CYAZYPYR® or *cyantraniliprole* containing products per calendar year whether applications are made to the soil or foliarly.
Cabbage looper	1B	*acephate* Acephate 97 and Orthene 75	8–12 oz	0.5–0.73	24 H/ 3 D	Apply thoroughly. Good lower leaf coverage is essential for control. See remarks under Budworms.
	6	*emamectin benzoate* Denim 16EC	8–12 oz	0.01–0.015	48 H/ 14 D	
	11	*Bacillus thuringiensis* See rates for budworms	2–2.9 oz	0.063–0.09	4 H/ 0 D	For best results apply when worms are small (0.5" long or less). Bt must be eaten by the insect to be effective. Worms will die several days after feeding.
	5	*spinosad* Blackhawk	1.6–3.2 oz	0.045–0.089	4 D/ 3 D	
Cutworms	1B	*acephate* Acephate 75 and Orthene 75	8–12 oz	0.5–0.73	24 H/ 3 D	Apply 25–50 gal of spray overtop of plants. Make application during late afternoon.
	3A	*bifenthrin* Brigade 2EC Capture LFR	4–6.4 oz 3.4–8.5 oz	0.0625–0.10 0.04–0.1	12 H/ Do Not Apply After Layby	Apply *bifenthrin* as a pre-transplant broadcast application incorporated into the top 4" of the soil and no more than 0.2 lb ai/A/ season. Do not apply later than layby.
	28	*chlorantroniliprole* Rynaxypyr Coragen	5–7.5 oz	0.065–0.098	4 H/ 1 D	

TOBACCO FIELD INSECT CONTROL

INSECT	MOA	CHEMICAL	RATE PER ACRE	POUNDS ACTIVE INGREDIENT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Cutworms (transplant water treatment)	1B	*acephate* Acephate 75 Acephate 90 Acephate 97	 10.5–16 oz 13.28 oz 8–12 oz	 0.5–0.75 0.74 0.5–0.73	24 H/ 3 D	Apply in transplant water. Mix thoroughly.
Flea beetles (transplant water treatment)	1B	*acephate* Acephate 97 and Orthene 97	8–12 oz	0.5–0.73	24 H/ 3 D	Apply in transplant water. Mix thoroughly.
	4A/NC	*imidacloprid* Admire Pro 4.6 Alias and Others 2F	 0.45–0.6 oz/1000 plants 1–1.4 oz/1000 plants	 0.016–0.02/1000 plants 0.016–0.02/1000 plants	12 H/ 14 D	
	4A	*thiamethoxam* Platinum SC	 0.8–1.3 oz/1000 plants	0.01–0.02/1000 plants	12 H/ 14 D	
	28	*cyantraniliprole* Verimark SC	10–13.5 fl oz	0.13–0.176	4 H/ NA	TRANSPLANT WATER APPLICATION. Rate is per acre. Use plant density to calculate greenhouse application rate.
Flea beetles	1B	*acephate* Acephate 97 and Orthene 97	8–12 oz	0.5–0.73	24 H/ 3 D	Use lower rates for small plants. Use higher rates for large plants and thoroughly cover the lower leaves. Do not apply *bifenthrin* later than layby and do not apply more than 0.2 lb ai/A/season.
	4A	*acetamiprid* Assail 30SG	2.5–4 oz	0.047–0.075	12 H/ 7D	
	4A/NC	*imidacloprid* Admire Pro 4.6	0.7–1.4 fl oz	0.025–0.05	12 H/ 14 D	
	4A	*thiamethoxam* Actara 25WG	2–3 oz	0.03–0.05	12 H/ 14 D	
	28	*cyantraniliprole* Verimark (tray drench)	10–13.5 oz	0.13–0.176	4 H/ NA	Apply as a transplant tray drench no earlier than 72 hours prior to planting in the field. Do not apply a total of more than 0.4 lb ai/A of CYAZYPYR® or *cyantraniliprole* containing products per calendar year whether applications are made to the soil or foliarly.
	28	*cyantraniliprole* Exirel (foliar spray)	10–20.5 oz	0.065–0.133	12 H / 7 D	Apply as a foliar spray in the field. Do not apply a total of more than 0.4 lb ai/A of CYAZYPYR® or *cyantraniliprole* containing products per calendar year whether applications are made to the soil or foliarly.
Grasshoppers	1B	*acephate* Acephate 75 and Orthene 75	0.26–0.6 lb	0.25–0.5	24 H/ 3 D	Apply thoroughly. Spraying around field borders may aid in preventing infestations. Do not apply *bifenthrin* later than layby and do not apply more than 0.2 lb ai/A/season.
	1B+3	*acephate* + *bifenthrin* Acenthrin	8–12 oz		24H/ Layby	Make no more than 2 foliar applications per season. Note long pre harvest interval associated with the inclusion of *bifenthrin*. Tobacco purchasers are concerned about residues of some pesticides in cured leaf. Use caution in making applications of *acephate* and Group 3 (pyrethroid) insecticides. Select other materials when available.

INSECT	MOA	CHEMICAL	RATE PER ACRE	POUNDS ACTIVE INGREDIENT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Hornworms	1B	*acephate* Acephate 75 and Orthene 75	0.26–0.6 lb	0.25–0.5	24 H/ 3 D	Apply thoroughly. Good coverage is essential for control. See remarks under Budworms.
	4A	*acetamiprid* Assail 30SG	2.5–4 oz	0.047–0.075	12 H/ 7D	
	28	*chlorantraniliprole* Coragen 1.67	5–7.5 oz	0.065–0.098	4 H/ 1 day	FIELD FOLIAR APPLICATION. Make no more than 4 applications per season (with at least 3 days between applications). Apply no more than 15.4 fluid ounces of Coragen or more than 0.2 pound *chlorantraniliprole* per acre per crop, which includes applications of Coragen, Besiege, and Durivo. Lower label rates of Coragen are likely sufficient for hornworms. SOME PURCHASERS may have concerns about *chlorantraniliprole* residues, particularly if used later in the growing season. Discuss *chlorantraniliprole* usage with purchaser prior to making applications. REFER TO YOUR CONTRACT BEFORE MAKING APPLICATIONS.
	28	*cyantraniliprole* Exirel	13.5–20.5 fl oz		12H/ 7D	
	6	*emamectin benzoate* Denim .16EC	8–12 oz	0.01–0.015	48 H/ 14 D	
	3	*lambda-cyhalothrin* Warrior 1CS	1.9–3.8 oz	0.015–0.03	24 H/ 40 D	Do not apply *lambda-cyhalothrin* fewer than 40 days before harvest. Although labeled for budworm control this product is not recommended due to the presence of resistance in the budworm population in Georgia. Bt must be eaten by the insect to be effective. Worms will die several days after feeding.
	5	*spinosad* Blackhawk	1.6–3.2 oz	0.045–0.089	4 D/ 3 D	
	11	*Bacillus thuringiensis* Dipel ES Dipel DF Agree S Biobit XL Biobit HP Condor OF Crymax WDG Deliver Javelin WG Lepinox WDG	 0.5–1 pt 0.5–1 lb 1–2 lb 0.5–1 pt 0.25–0.5 lb 0.6–1 qt 0.5–1.5 lb 0.5–1.5 lb 1–1.25 lb 1–2 lb		/0 D 4 H/ 4 H/ 4 H/ 4 H/ 4 H/ 4 H/ 4 H/ 4 H/ 4 H/ 12 H/	
	28	*cyantraniliprole* Verimark (tray drench)	10–13.5 oz	0.13–0.176	4 H / NA	Apply as a transplant tray drench no earlier than 72 hours prior to planting in the field. Do not apply a total of more than 0.4 lb ai/A of CYAZYPYR® or *cyantraniliprole* containing products per calendar year whether applications are made to the soil or foliarly.
	28	*cyantraniliprole* Exirel (foliar spray)	10–20.5 oz	0.065–0.133	12 H / 7 D	Apply as a foliar spray in the field. Do not apply a total of more than 0.4 lb ai/A of CYAZYPYR® or *cyantraniliprole* containing products per calendar year whether applications are made to the soil or foliarly.

TOBACCO FIELD INSECT CONTROL

INSECT	MOA	CHEMICAL	RATE PER ACRE	POUNDS ACTIVE INGREDIENT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Japanese beetles	1B	*acephate* Orthene 97	0.75 lb		24 H/ 3 D	Japanese beetle infestations may be spotty within fields and do not typically require treatment. There are many formulations of *acephate*. Do not use more than 4⅛ lb/acre Orthene (4 lb AI/acre). This includes greenhouse, transplant water, soil, and foliar applications. Tobacco purchasers are concerned about residues of some pesticides in cured leaf. Use caution in making applications of *acephate* and Group 3 (pyrethroid) insecticides. Select other materials when available.
	1B + 3	*acephate* + *bifenthrin* Acenthrin	8–12 oz		24 H/ Layby	Make no more than 2 foliar applications per season. Note long pre harvest interval associated with the inclusion of *bifenthrin*. Tobacco purchasers are concerned about residues of some pesticides in cured leaf. Use caution in making applications of *acephate* and Group 3 (pyrethroid) insecticides. Select other materials when available.
	3 + 28	*lambda-cyhalothrin* + *chlorantraniliprole* Besiege	5.0–9.0 fl oz		24 H/ 40 D	NOTE THE LONG PREHARVEST USE RESTRICTION. Apply no more than 0.2 lb *chlorantraniliprole* per acre per crop, which includes applications of Coragen, Besiege, and Durivo. Tobacco purchasers are concerned about residues of some pesticides in cured leaf. Use caution in making applications of *acephate* and Group 3 (pyrethroid) insecticides. Select other materials when available.
	3 + 4	*lambda-cyhalothrin* + *thiamethoxam* Endigo ZC	4.0–4.5 fl oz		24 H/ 40 D	NOTE THE LONG PREHARVEST USE RESTRICTION. Tobacco purchasers are concerned about residues of some pesticides in cured leaf. Use caution in making applications of *acephate* and Group 3 (pyrethroid) insecticides. Select other materials when available.
	4A	*imidacloprid* Admire Pro (others) 2F	1.4 fl oz 3.2 fl oz		12 H/ 4 D	FIELD FOLIAR APPLICATION. Avoid using only Group 4A materials for season-long control of insects with more than 1 generation. Following treatments of Group 4A materials, rotate to a different MOA before making additional applications of a Group 4A material.
	4A	*thiamethoxam* Actara 25 WDG	2–3 oz		12 H/ 14 D	Make only one application of *thiamethoxam* per season. *Thiamethoxam* is also the active ingredient in Platinum.
Mole crickets	3A	*bifenthrin* Brigade 2EC Capture LFR	4–6.4 oz 3.4–6.8 oz	0.0625–0.10 0.04–0.10	12 H/ Do Not Apply After Layby	
Stink bugs	1B	*acephate* Acephate 97 and Orthene 97	0.48–0.77 lb	0.5–0.75	24 H/ 3 D	Apply in sufficient water to give thorough coverage.
	1B + 3	*acephate* + *bifenthrin* Acenthrin	8–12 oz		24 H/ 3 D	Make no more than 2 foliar applications per season. Note long pre-harvest interval associated with the inclusion of *bifenthrin*. Tobacco purchasers are concerned about residues of some pesticides in cured leaf. Use caution in making applications of acephate and Group 3 (pyrethroid) insecticides.
	3A	*bifenthrin* + *imidacloprid* Brigadier 2SC	2.56–6.4 oz	0.04–0.10	12 H/ Do Not Apply After Layby	Do not apply after layby.
	3A	*bifenthrin* Brigade 2EC Capture LFR	2.56–6.4 oz 3.4–6.8 oz	0.04–0.10 0.04–0.10	12 H/ Do Not Apply After Layby	Do not apply after layby.

INSECT	MOA	CHEMICAL	RATE PER ACRE	POUNDS ACTIVE INGREDIENT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Thrips		The foliar treatments for flea beetles give helpful control.				See Tobacco Field Disease Control Section for recommendations to suppress tomato spotted wilt virus with *imidacloprid*. **Thrips are the vector for this disease.**
Tobacco splitworm or potato tuberworm (transplant water treatment)	Timely foliar sprays of *bifenthrin*, *l-cyhalothrin* or *chlorantraniliprole*, (also can be applied in transplant water) provide some control. See hornworm control for rates when applying foliar applications.					
	28	*chlorantraniliprole* Coragen 1.67	5–7.5 oz	0.065–0.098	4 H/ 1 day	Apply transplant water uniformly in the root zone or poor performance will occur.
Vegetable weevil	1B	*acephate* Acephate 97 and Orthene 97	0.5–0.75 lb		24 H/ 3 D	Treat plants in late afternoon for best control. Spray a band over center of row using a good volume of water. Do not use more than 4 ⅛ lb/acre Orthene (4 lb AI/acre). This includes greenhouse, transplant water, soil, and foliar applications. Tobacco purchasers are concerned about residues of some pesticides in cured leaf. Use caution in making applications of acephate and Group 3 (pyrethroid) insecticides. Select other materials when available.
	1B + 3	*acephate* + *bifenthrin* Acenthrin	6–16 oz		24 H/ Layby	Make no more than 2 foliar applications per season. Note long pre harvest interval associated with the inclusion of bifenthrin. Tobacco purchasers are concerned about residues of some pesticides in cured leaf. Use caution in making applications of acephate and Group 3 (pyrethroid) insecticides. Select other materials when available.
	3A	*lambda-cyhalothrin* Warrior II with Xeon Technology	0.96–1.92 fl oz		24 H/ 40 D	NOTE THE LONG PREHARVEST USE RESTRICTION. Tobacco purchasers are concerned about residues of some pesticides in cured leaf. Use caution in making applications of acephate and Group 3 (pyrethroid) insecticides. Select other materials when available.
	3 + 28	*lambda-cyhalothrin* + *chlorantraniliprole* Besiege	5.0–10.0 fl oz		24 H/ 40 D	NOTE THE LONG PREHARVEST USE RESTRICTION. Apply no more than 0.2 lb chlorantraniliprole per acre per crop, which includes applications of Coragen, Besiege, and Durivo. Tobacco purchasers are concerned about residues of some pesticides in cured leaf. Use caution in making applications of acephate and Group 3 (pyrethroid) insecticides. Select other materials when available. Table 5-8B. Insect Control on Flue-Cured and Burley Tobacco in the Field.
Wireworms	3A	*bifenthrin* Brigade 2EC Capture LFR[1]	 4–6.4 oz 3.4–6.8 oz	 0.0625–0.10 0.04–0.1	12 H/ Do Not Apply After Layby	Apply all insecticides to the soil surface 1–2 weeks before transplanting and mix into the top 3–6" of soil immediately. *Bifenthrin* can also be applied at these rates as a transplant water treatment instead of a broadcast application.
	3A	*bifenthrin* + *imidacloprid* Brigadier[1,2]	3.8–6.8 fl oz		12 H/ Layby	1. Capture LFR and Brigadier wireworm control data are limited. 2. Brigadier is a combination of *bifenthrin*, a pyrethroid, and *imidacloprid*.
Mole crickets or wireworms (transplant water treatment) Wireworms (only)	3A	*bifenthrin* Brigade 2EC Capture LFR	4–6.4 oz 3.4–6.8 oz	0.0625–0.10 0.04–0.10	12 H/ Do Not Apply After Layby	Apply in transplant water. Mix thoroughly. Do not apply more than 0.2 lb ai/A of *bifenthrin*/season. Timely foliar sprays prior to layby of Brigade and Warrior can provide some control. See hornworm control for rates
	4A	*imidacloprid* Admire Pro 4.6 Alias and Others 2F	 0.6–1.2 oz/1000 plants 1.4–2.8 oz/1000 plants	0.02–0.04/1000 plants 0.02–0.04/1000 plants	12 H/ 14 D	
	4A	*thiamethoxam* Platinum and T-Moxx 2SC	1.3 oz/1000 plants	0.02/1000 plants	12 H/ 14 D	

TOBACCO FIELD DISEASE CONTROL

Paul Bertrand, Extension Plant Pathologist
J. Michael Moore, Extension Agronomist

DISEASE	MOA	CHEMICAL	RATE PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Black shank	4	TRANSPLANT WATER: *oxathiapiprolin* Orondis Gold + *mefenoxam* Ridomil Gold SL	24.0–27.8 oz	48 H/ 5 D	**TRANSPLANT WATER:** Mix the Pre-mix formulation in transplant water while planting tobacco seedlings for control of black shank and Pythium seedling disease. Apply in at least 200 gallons of transplant water per acre. There is a risk of plant injury with less than 200 gpa and greater risk when applied in less than 100 gpa. Immediate and sufficient irrigation should be applied to wet the soil in the root zone when drought conditions exist at transplanting. Use the high labeled rate if the disease is expected to be severe. Follow with an additional application of a fungicide such as Ridomil Gold SL or Presidio at first cultivation and/or layby if necessary.
	4	TRANSPLANT WATER: *oxathiapiprolin* Orondis Gold + *mefenoxam* Ridomil Gold SL (Co-Pack will still be available as an option.)	4.8 oz + 8 oz	4–48 H/ 7 D 48 H/ NA	**TRANSPLANT WATER:** Mix the co-pack formulation in transplant water and apply in the transplant furrow while planting tobacco seedlings for control of black shank caused by *Phytophthora nicotianae*. Apply 4–8 oz/A Ridomil Gold SL in at least 100–200 gal of transplant water/A. Use the high rate if the disease epidemic is expected to be severe. Make at least 1 field application of Ridomil Gold SL or Presidio at first cultivation and/or layby if necessary. Immediate and sufficient irrigation should be applied to wet the soil in the root zone when drought conditions exist at transplanting.
	4	FIELD: *mefanoxam* Ridomil Gold SL	1 pt PPI + 0.5–1 pt 1st cultivation + 0.5–1 pt last cultivation	48 H/ NA	**FIELD:** Broadcast-Incorporate at or just prior to setting. *Mefenoxam* may be applied to the beds at first plowing if heavy rainfall (> 1") occurred between the PPI treatment and transplanting. Apply *mefenoxam* at layby using two drop nozzles per row. Direct spray to bed. Follow with layby plowing. Applying *mefenoxam* over the top to plant foliage will provide NO black shank control. **DO NOT APPLY ULTRA FLOURISH IN THE TRANSPLANT WATER.**
	4	*mefanoxam* Ultra Flourish Ultra Flourish 2E	1 qt PPI + 1 qt 1st cultivation + 1 qt last cultivation	48 H/ NA	
	4	*metalaxyl* MetaStar 2E	2 qt. PPI + 1–2 qt 1st cultivation + 1–2 qt last cultivation	48 H/ NA	
	43	*fluopicolide* Presidio	4 oz	12 H/ 7 D	Apply Presidio to the soil at the first cultivation or layby in the same manner as *mefenoxam*. In order to delay the development of resistance to this material, growers are encouraged to make a soil application of Presidio at either the first cultivation or final cultivation with an alternate material used prior to and/or after the Presidio application. Multiple applications of Presidio without alternating to another fungicide results in continuous exposure of the fungus to this fungicide and likely earlier development of resistance by the black shank. In a two-application post-transplant program use Presidio once either at 1st cultivation or last cultivation (layby).

DISEASE	MOA	CHEMICAL	RATE PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Blue Mold	49	*oxathiapiprolin* or *OXTP* Orondis Ultra + *mandipropamid* (Revus) (Preferred formulation after 2021)	5.5–8.0	4 H/ 7 D	Begin applications prior to disease development, and continue on a 7–10 day interval. Make no more than 2 consecutive applications before switching to a fungicide with a different mode of action. Do not follow soil applications of Orondis Gold with foliar applications of Orondis Ultra. Use either soil applications or foliar applications but not both. Apply at least 15 gpa increasing as plants grow to ensure thorough coverage of the foliage. Addition of a spreading/penetrating type of adjuvant such as a non-ionic surfactant, organosilicone, or blend at labeled rates may enhance disease control.
	49	*oxathiapiprolin* or *OXTP* Orondis Ultra + *mandipropamid* (Revus) (Co-Pack will still be available as an option.)	2–4.8 oz + 8 oz	4 H/ 7 D	Begin applications prior to disease development, and continue on a 7–10 day interval. Make no more than 2 consecutive applications before switching to a fungicide with a different mode of action. Do not follow soil applications of Orondis Gold with foliar applications of Orondis Ultra A. Use either soil applications or foliar applications but not both.
	M3	*mancozeb* Dithane Rainshield 75 DF, Manzate Pro Stick, Penncozeb 75 DF	1.5–2 lb/100 gal	24 H/ 21 D	Begin application prior to disease development and continue throughout the season on a 7–10 day interval. Do not make consecutive applications before switching to an effective non-Group 40 fungicide. Orondis Ultra B may be tank-mixed with another fungicide labeled for blue mold that has a different mode of action. The addition of a spreading/penetrating type adjuvant such as a non-ionic based surfactant may improve activity. As a part of a resistance management strategy: Apply a maximum of 4 sprays during one crop cycle. Do not apply sequential applications unless otherwise stated in the crop section. Presidio applied to the row bed prior to the first cultivation may provide control of Blue Mold if taken up by the plant roots. Presidio may be applied as a foliar application to provide plant coverage. Control may be improved if another labeled material is applied with it.
	43	*fluopicolide* Presidio	4 oz	12 H/ NA	
	49	*mandipropamid* Revus	8 oz	4 H/ 7 D	
	40	*dimethomorph* Forum Fungicide	See below	12 H/ 0 D	Select rate based on table below. Apply with drops as necessary to get full crop coverage.
		WEEKS OF GROWTH AFTER TRANSPLANT	**RATE OF FORUM (OUNCES OF PRODUCT)**	**WATER OUTPUT (GAL/A)**	Begin applications when the Blue Mold Advisory states that conditions favor development of blue mold, and before the onset of disease infection. Continue applications on a 5–7 day spray schedule until weather conditions favoring infection and sporulation decrease. Discontinue sprays when and if the threat of blue mold subsides. Restrictions (Field Application): DO NOT exceed 8 oz/A/ application. DO NOT exceed 30 oz/A of FORUM/season. Full plant coverage is required for blue mold control with FORUM
		Recently Transplanted to 3 weeks	2	20	
		3–4 weeks (Knee High)	3	40	
		4–5 weeks (Waist High)	4	60	
		6–7 weeks (Chest High)	6	80	
		7 weeks+ (Shoulder to topping)	7	100	
	21	*acibenzolar-S-methyl* Actigard 50WG	0.5 oz	12 H/ 21 D	Begin treatment when plants reach 18" high. Make up to 2 applications on a 10 day schedule.
Blue Mold	11	*azoxystrobin* Quadris	6–12 oz (0.1–0.2 lb ai)	4 H/ 21 D	Alternate with FORUM. If blue mold is present begin with FORUM. DO NOT use more than 0.54 lb ai/A/year. Full plant coverage is required for disease control with either FORUM or QUADRIS. Quadris will give some control of blue mold and very good control of target spot if plant coverage is complete.
	21	*acibenzolar-S-methyl* Actigard 50WG	1 oz/100,000 field ready seedlings	12 H/ 21 D	Spray seedlings in beds or plant houses 5–7 days before transplanting. Use transplant water. DO NOT let Actigard-treated plants in trays or boxes dry out.

TOBACCO FIELD DISEASE CONTROL

DISEASE	MOA	CHEMICAL	RATE PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Target Spot and Frogeye Leaf Spot	11	azoxystrobin Quadris	6–12 oz (0.1–0.2 lb ai)	4H/ 21D	Quadris applications should begin prior to disease development with the first application to cover all leaves on the plant prior to or immediately following the final cultivation. Make an additional application 10–14 days later than the first with nozzle tip selctions and arrangement to provide maximum coverage of the lower one half of the leaves on the stalk. An additional application may be made 10–14 days after the second to provide maximum coverage of the lower two thirds of the stalk. Apply no more than 30 fl oz of product/A/year with no more than two applications at the high rate of (12 fl oz/A). Initial applications may be sufficient at 8–10 fl oz/A. Do not apply within 21 days of harvest (21 day PHI). Do not tank mix Quadris with anything other than water to reduce the potential for crop injury.
Tomato Spotted Wilt	21	*acibenzolar-S-methyl* Actigard 50WG	1 oz/100,000 field ready seedlings	12 H/ 21 D	Spray seedlings in beds or plant houses 5–7 days before transplanting. Use transplant water. DO NOT let Actigard-treated plants in trays or boxes dry out.
	4A	*imidacloprid* Admire Pro 4.6 SC	0.8–1.2 oz/1000 tray cells (tray drench) 0.8–1.2 oz/1000 plants (transplant water)	12 H/ 14 D	**Plant house tray drench**. Spray Admire onto wetted foliage and immediately rinse with enough water to wash the Admire off foliage into the root media (10–12 gal/100,000 cells). Work supporting this recommendation was conducted in trays with 242 or 288 cells per tray. Little experience is available with trays of greater seedling density (338) which produce smaller plants with smaller root systems. **Combine with transplant water.** Mix thoroughly.
	4A	Generic Imidacloprid 2F Alias Couraze Imia-E Ag Macho Nuprid Torrent Generic 2F	1.4–2.8 oz/1000 tray cells 1.8–2.8 oz/A Transplant water.	12 H/ 14 D	**Tray drench as above**. **In transplant water as above.**
	4A	*thiamethoxam* Platinum 2SC/ T-Moxx 2SC	1.3 oz	12 H/ 14 D	Tray drench as above. Platinum is not suited for transplant water application.

TOBACCO FIELD NEMATODE CONTROL

Paul Bertrand, Extension Plant Pathologist
J. Michael Moore, Extension Agronomist

FUMIGANT NEMATICIDES

CHEMICAL	MOA	RATE PER ACRE	RATE PER 100 FT OF ROW	REI/PHI (Hours or Days)	REMARKS
			ROW TREATMENT		
Telone II	8B	6 gal	cc 184 fl oz 6.2	5 H/ 0 D	Inject 8" deep on the flat or 14–16" below top of a high wide bed. Make application when soil temperature is 55°F or above. Seal by bedding or dragging. Wait 3 weeks between application and setting. Break bed open 1–2 days prior to setting.
Pic Plus (*Chloropicrin* 86%)	8B	6 gal		5 H/ 0 D	

* Use a fumigant when potential for nematode damage is moderate to high, or when javanese (*Meloidogyne javanica*) or peanut (*M. arenaria*) root-knot nematode is known to occur, or when root-knot nematodes and black shank or Fusarium wilt are present.

** Multipurpose fumigants such as Telone C-17 or C-35 are also effective. These products are more costly than Telone II and only provide cost effective disease control when Granville wilt is also known to occur. In Georgia, multipurpose fumigants have never shown a consistent benefit for black shank control beyond the reduction in black shank associated with root-knot nematode control.

*** Pic Plus (*chloropicrin* 86%) applied at 4 gal/A will provide excellent control of root-knot nematode (rkn) but with quicker resurgence or rebound of rkn in the tobacco root systems in mid to late season than is seen with Telone II. No additional benefits from Pic Plus such as black shank control should be expected. Growers with fields with black shank history should follow recommended black shank programs involving Rotation, Resistance and Chemical Controls in addition to the use of Pic Plus for nematode control.

NON-FUMIGANT NEMATICIDES

CHEMICAL	MOA	RATE PER ACRE	REI/PHI (HOURS OR DAYS)	REMARKS
fluensulfone NIMITZ	?	3.5–7 pt	—	For most economical use, apply 3.5–5 pts of NIMITZ in a minimum of 15 gal of water per acre in a 15–20" band on top of a preformed bed and mechanically incorporate uniformly to a depth of 6–8". Apply at least 7 days before transplanting. Do not apply more than 1 application/crop and no more than 3.5 lbs *fluensulfone*/A/calendar year.
fluopyram Velum Prime	FRAC7	6.5–6.84 fl oz/A	12 H/ 30 D	Applied as an in-furrow soil drench at transplanting at 6.84 oz/A in 75–150 gallons per acre. Do not apply more than 13.7 fl oz of VELUM PRIME (0.446 lbs *fluopyram*) per acre per year, regardless of formulation or method of application. Do not apply VELUM PRIME within 30 days of harvest. For soil application, to limit the potential for development of disease resistance to this chemical class, the first foliar fungicide application after VELUM PRIME should be a product from a different FRAC group.

Temik is no longer labeled for use on tobacco.

Nemacur 3 and Mocap 6EC are no longer being manufactured, but existing supplies may be used.

Results after use of non-fumigant nematicides depend on thorough incorporation in the soil prior to forming beds and transplanting.

TOBACCO WEED CONTROL (Flue-Cured)

J. Michael Moore, Extension Agronomist—Tobacco

TIMING	MOA	HERBICIDE	BROADCAST RATE/ACRE		REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
			AMOUNT OF FORMULATION	POUNDS ACTIVE INGREDIENT/A		
Pre-plant	13	*clomazone* Command 3ME 3 lb/gal	2–2.66 pt/A	0.75–1	12 H/ 65 D	Apply Command as a broadcast spray at low pressure and large droplet size. Incorporate to a depth not to exceed 1" prior to transplanting. Transplant roots should be placed below the treated area. Off-site movement of spray drift or vapors of Command can cause foliar whitening or yellowing of some plants (fruit and nut trees, berries, roses, other landscape plants, and greenhouse plants). Temporary whitening and /or yellowing of the treated crop and rotational crops may occur. The crop should grow through this with no adverse impact. **Do not** plant small grain for grain less than 12 months after application of Command. **Do not** graze treated areas for 9 months.
	3	*pendimethalin* Prowl 3.3E Pendimax Repose Acumen 3.3 lb/gal Prowl H2O 3.8 EC 3.8 lb/gal	1.8–2.4 pt 1.8–2.4 pt 1.8–2.4 pt 1.8–2.4 pt 2.0–2.5 pt	0.75–1	24 H/ —	Apply and soil incorporate within 14 days prior to transplanting. Prior to bedding, apply and soil incorporate Prowl, or Devrinol with a power-driven rotary tiller set to cut 4" deep or incorporate by disking and cross disking with a disk harrow set to cut 4-6" deep. If applied to preformed beds, "board off" to planting level and incorporate with a power-driven rotary tiller set to cut 4" deep.
	15	*napropamide* Devrinol DF XT Devrinol 2XT	2–4 lb 2–4 qt	1–2	24 H/ —	Devrinol is for field use only. Not labeled for tobacco seedbeds due to plant injury.
	8	*pebulate* Tillam 6E	5 pt 5 fl oz	4	12 H/ —	Tillam should be used if nutsedge is a problem in the field. Apply and incorporate immediately either before or after bedding as discussed above. If possible, apply Tillam at least 2 days before transplanting.
	8	*pebulate* 4.0 Tillam 6E 6 lb/gal + *napropamide* Devrinol 50DF Devrinol 2XT	5 pt 5 fl ox + 2 lb 2 qt	4 + 1	12 H/ —	Tillam and Devrinol may be tank-mixed to provide control of nutsedge and many annual grasses and some broadleaf weeds. Apply andincorporate immediately either before or after bedding as discussed above. If possible, apply this combination at least 2 days before transplanting.

TIMING	MOA	HERBICIDE	BROADCAST RATE/ACRE: AMOUNT OF FORMULATION	BROADCAST RATE/ACRE: POUNDS ACTIVE INGREDIENT/A	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Pre-transplant (surface application only)	14	*sulfentrazone* Spartan 4F Blanket 4F 4 lb ai/gal	8 oz	0.25	12 H/ —	**DO NOT INCORPORATE!** **CALIBRATION IS IMPORTANT!** Application rate for Spartan Charge and Spartan DF should be limited to 0.25 lb ai/A (10.2 oz Spartan Charge; 8 oz Spartan 4F). Excessive application rates or poor calibration may result in injury to the tobacco. Spartan Charge and Spartan 4F should not be applied to soils classified as sand with less than 1% organic matter and shallow groundwater. Most Georgia tobacco soils would make the loamy sand or sandy loam categories of coarse textured soils. Application methods should be directed toward applying and maintaining the chemical at the soil surface. Spartan may be surface applied up to 14 days prior to transplanting after all other soil incorporation practices have been performed where transplanting occurs without bedding. If beds are formed prior to transplanting, the top of the beds should be dragged or knocked off prior to application of Spartan. Transplant into the treated bed without pushing additional soil from the bed. Spartan should not be incorporated into the bed greater than 2". **DO NOT APPLY SPARTAN or SPARTAN CHARGE POST-TRANSPLANT OVER THE TOP OF TOBACCO AS CROP INJURY MAY OCCUR.** Rotational Guidelines limit recropping treated soil to: wheat—4 months, field corn—10 months, cotton—18 months, canola—24 months. Although recropping to vegetables is not mentioned on the label, the limited information available would discourage recropping treated soil to most vegetables in less than 12 months after treatment.
	14 + 14	*carfentrazone-ethyl* + *sulfentrazone* Spartan Charge 0.35 + 3.15 lb ai/gal	5.7–10.2 oz	0.016–0.028 + 0.157–0.25	12 H/ —	
Post-transplanting —with hooded or shielded sprayer	15	*napropamide* Devrinol DF XT Devrinol 2XT	2–4 lb 2–4 qt	1–2	24 H/ —	Apply directly over the top of tobacco immediately after transplanting to control weeds before they emerge. Irrigate with 0.5" of water if no rainfall occurs within 3–4 days. Refer to Remarks for Command under the Preplant section for comments on application, off-site movement, and rotation. Tender plant-bed plants and particularly greenhouse plants have been shown to be very sensitive to Command and some leaves may turn white for a short period of time. This does not usually cause a reduction in yield and has not been widely observed in Georgia. Based on the results of accumulated work in Georgia Spartan 4F or Spartan Charge has received 2(ee) labeling providing for the application of Spartan 4F or Spartan Charge with a shielded sprayer within 7 days after transplanting but prior to weed emergence and cultivation. Tobacco transplants should be protected from Spartan 4F or Spartan Charge spray using an appropriately shielded sprayer. Apply Spartan 4F or Spartan Charge solution to provide coverage of all row-bed surfaces excluding 4" on both sides of the tobacco transplants (8" band). Cultivate tobacco as soon as possible and within 7 days of Spartan 4F or Spartan Charge application to provide slight incorporation and move treated soil around plants and to cover untreated press wheel track (8" band).
	13	*clomazone* Command 3ME 3 lb/gal	2–2.66 pt/A	0.75–1	12 H/ 65 D	
	14	*sulfentrazone* Spartan 4F Blanket 4F 4 lb ai/lb	8 oz	0.25	12 H/ —	
	14 + 14	*carfentrazone-ethyl* + *sulfentrazone* Spartan Charge 0.35 + 3.15 lb ai/gal	5.7–10.2 oz	0.016–0.028 + 0.157–0.25	12 H/ 6 D	
	14	*carfentrazone* Aim EC 2 lb ai/gal	0.8–1.5 fl oz	0.013–0.023 lb ai	12 H/ 6 D	Use Aim EC for post-emergence control of many broadleaf weeds (including most morningglory species other than small flowers) up to 4" high growing in between the rows of tobacco. Use higher rates when treating more mature weeds or dense vegetative growth. **COVERAGE IS ESSENTIAL FOR GOOD CONTROL.** Use adequate spray volume to achieve thorough coverage, but a minimum of 10 gal of finished spay per acre is required. Use a quality crop oil concentrate (COC) at 1% v/v (1 gal of COC/100 gal of spray solution). Do Not Allow spray solution to contact tobacco foliage or green stem tissue. Do Not Apply within 6 days of harvest. Do Not Apply more than 3.06 fl oz (0.48 lb ai)/A/season.

TOBACCO WEED CONTROL (Flue-Cured)

TIMING	MOA	HERBICIDE	BROADCAST RATE/ACRE		REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
			AMOUNT OF FORMULATION	POUNDS ACTIVE INGREDIENT/A		
LAYBY (for post-emergence control of grasses)	15	*napropamide* Devrinol DF XT Devrinol 2XT	 2–4 lb 2–4 qt	1–2	24 H/ —	These herbicides are applied following the last cultivation (usually 4–6 weeks after transplanting). Spray equipment should be set up with drop nozzles to direct the herbicide spray to the shoulders of the tobacco beds and middles. These herbicides will not control established weeds.
	3	*pendimethalin* Prowl 3.3E Pendimax Repose Acumen 3.3 lb/gal Prowl H2O 3.8 EC 3.8 lb/gal	 1.8–2.4 pt 1.8–2.4 pt 1.8–2.4 pt 1.8–2.4 pt 1.5–2.0 pt	0.75–1	24 H/ —	
	1	*sethoxydim* Poast 1.5 lb/gal	 1–1.5 pt	0.19	12 H/ 42 D	Provides selective broad spectrum post-emergence control of annual and perennial grass weeds. Poast does not control sedges or broadleaf weeds. Addition of a non-phytotoxic oil concentrate at 1 qt/A is required. Do Not apply within 42 days of harvest. Do Not apply to grasses under stress, such as stress due to lack of moisture or herbicide injury, as unsatisfactory control may result. Do not cultivate within 7 days before or 7 days after applying Poast.
After First Harvest Post-Directed or Banded	14	*carfentrazone* Aim EC 2 lb ai/gal	0.8–1.5 fl oz	0.013–0.023 lb ai	12 H/ 6 D	Aim EC may be applied with drop nozzles or other spray equipment capable of directing the spray to the target weeds and away from sensitive plant parts. Aim EC may be applied up to the maximum rate for the target crop for the control of larger weed sizes or weeds not controlled with lower use rates. **Directed spray after first priming (Flue-Cured Tobacco Only).** Aim EC may be applied as a directed spray application after the first priming in only flue cured tobacco only for the control of emerged and actively growing broadleaf weeds. Directed spray equipment should position nozzles a minimum of 3–4" above the soil, with nozzles directed underneath the crop canopy. Spray solution should be directed at the base of tobacco plants for minimal contact with foliage while maintaining maximum contact with broadleaf weeds that are at appropriate treatment size. Do not apply when conditions favor drift or wind is above 10 mph. Use Aim EC for post-emergence control of many broadleaf weeds (including most morningglory species other than small flowers) up to 4" high growing in between the rows of tobacco. Use higher rates when treating more mature weeds or dense vegetative growth. **COVERAGE IS ESSENTIAL FOR GOOD CONTROL.** Use adequate spray volume to achieve thorough coverage, but a minimum of 10 gal of finished spray/A is required. Use a quality crop oil concentrate (COC) at 1% v/v (1 gal of COC/100 gal of spray solution). Do not allow spray solution to contact tobacco foliage or green stem tissue. Do Not Apply within 6 days of harvest. Do not apply more than 3.06 fl oz (0.48 lb ai)/A/season.

TOBACCO WEED RESPONSE TO HERBICIDES (Flue-Cured)

J. Michael Moore, Extension Agronomist—Tobacco

	PLANT BED & FIELD	FIELD APPLICATION										
		PRE-TRANSPLANT						POST-TRANSPLANT		LAYBY		POST-DIRECTED OR BANDED
		SURFACE APPLIED	INCORPORATED									
	POAST	SPARTAN CHARGE	COMMAND	PROWL	DEVRINOL	TILLAM	DEVRINOL + TILLAM	DEVRINOL	COMMAND	DEVRINOL	PROWL	AIM EC
PERENNIAL WEEDS												
purple nutsedge	P	E	P	P	P	P	P	P	P	P	P	N
yellow nutsedge	P	E	P	P	P	F	F	P	P	P	P	N
ANNUAL GRASSES												
crabgrass	E	F–G	E	E	E	E	G	E	E	E	E	N
crowfootgrass	E	F	G	E	E	E	G	E	G	E	E	N
goosegrass	E	F–G	G	E	E	G	G	E	G	E	E	N
fall panicum	E	F–G	G	G	G	G	G	G	G	G	G	N
johnsongrass (seedling)	E	F	F	G	F	G	G	F	F	F	G	N
sandbur	G	P–F	F	G	—	G	G	—	F	—	G	N
Texas panicum	G	F	G	G	—	P	P	—	G	—	G	N
BROADLEAFS												
bristly starbur	P	F–G	P	P	P	G	G	P	P	P	P	N
Florida beggarweed	P	G–E	F–G	P	P	P	P	P	F–G	P	P	F
cocklebur	N	F–G		P	P	P	P	P		P	P	G
Florida pusley	P	F–G	F–G	E	G	E	E	G	F–G	G	E	
lambsquarters	N	E	F–G	G	G	G	G	G	F–G	G	G	E
pigweed	N	E	P	G–E	G	G	G	G	P	G	G–E	E
prickly sida	N	P	G	P	P	F	F	P	G	P	P	
purslane	N	G–E	F–G	E	E	G	E	E	F–G	E	E	E
ragweed	N	P	F	P	F	G	G	F	F	F	P	F
smartweed	N	E	G	PF	P	P	P	P	G	P	P–F	E
morningglory sp.	N	E	P	P	P	P	P	P	P	P	P	G–E

E—Excellent control, weed kill 90% or above.
G—Good control, weed kill 80% or above.
F—Fair control, weed kill 70% or above.
P—Poor control, less than 70% control.
N—No Control.
If no symbol is given, weed response is unknown.
Ratings are based on average to good soil and weather conditions for herbicide performance.

Bermudagrass and rhizome johnsongrass cannot be controlled with presently labeled tobacco herbicides in the same growing season. However, control can be achieved with Round-Up in the season prior to transplanting tobacco (check label for rates and application).

Transplant into the Spartan Charge treated bed surface without pushing additional soil from the bed. Spartan Charge should not be incorporated into the bed greater than 2". Do not apply Spartan Charge post-transplant over the top of tobacco as crop injury may occur.

TOBACCO SUCKER CONTROL (Flue-Cured)

J. Michael Moore, Extension Agronomist—Tobacco

CHEMICAL TYPE	CHEMICAL	FORMULATION RATE PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Contact	Fatty Alcohol C_6, C_8, C_{10}, and C_{12} alcohol mixture			Solution concentration and timing of fatty alcohol solutions are very important. Apply the first contact treatment at a 3% concentration (1.5 gal of chemical in 48.5 gal of water) when 30–40% of plants are in the early button stage. Make a second contact application at a 4% concentration (2 gal of chemical in 48 gal of water) 5–7 days later. Third applications may be made 5–7 days later if the crop is not uniform, weather conditions are not suitable for application of maleic hydrazide or if harvest must occur within 7 days. Use approximately 50 gal of solution/A or enough to provide for spray solution to reach the bottom of the stalk. Use 2 TG-3 nozzle tips and 1 TG5 or equivalents per row with 20–25 psi pressure operated from 12–16" above the top of the button or stalk at 2.5–3 mph. **Excess nitrogen or high soil and plant moisture conditions may increase the chance of leaf drop where contact solutions are applied and promotes excess sucker growth.** If the application of contacts starts after the 30–40% early button stage, start with 4% and follow 5–7 days later with a 5% application.
	85% Active Ingredient			
	Various Brands Fair 85 Off-Shoot T Royaltac-M Sucker Plucker	 1.5–2.5 gal 1.5–2.5 gal 1.5–2.5 gal 1.5–2.5 gal	24 H/ 7 D	
	n-Decanol (C_{10}) 79% Active Ingredient Antak Fair-Tac Royaltac	 1.5–2.25 gal 1.5–2.25 gal 1.5–2.25 gal	24 H/ 7 D	C_{10} alcohols are long chain alcohols and are said to be "hotter" than the mixture of alcohols found in the other products. The rate is normally reduced 0.5% less than for the products that are mixtures of C_6, C_8, C_{10}, and C_{12} alcohols.
Systemic	Maleic Hydrazide (potassium salt) (MH)Various Brands		12 H/ 7 D	Apply 5–7 days after last contact treatment. Use 30–40 gal of water/A and a pump pressure of 22–25 psi. Apply to upper sides of leaves on upper one-third of stalks.
	(1.5 lb MH/gal) Fair Plus Royal MH Super Sucker Stuff	 1.5 gal 1.5 gal 1.5 gal	12 H/ 7 D	Do Not Apply Sucker Control Chemicals When Tobacco Is Wilted or Wet or under Windy Conditions. Do Not Use drop nozzles for application of MH. Allow 7 Days or until after rainfall between MH application and harvest.
	(2.25 lb MH/gal) Fair 30 Royal MH Xtra Sucker Stuff	 1 gal 1 gal 1 gal	12 H/ 7 D	
	Water-Soluble MH 60% by wt of MH Fair 80 SP Royal MH-30 SG Sucker Stuff 60 WS	 3.75 lb 4–5 lb 3.75 lb	12 H/ 7 D	Fair 80 SP is a water-soluble powder packaged in dissolvable 3.75 lb containers. Royal MH-30 SG is a water-soluble granular material packaged in dissolvable 7.5 lb containers. Sucker Stuff 60 WS is packaged in water dissolvable packets. Two packets are packaged in one paper over-pack bag weighing 3.75 lbs to provide 2.25 lbs MH.
Contact-Systemic Mix	38.3% ai Fatty alcohol (n-Decanol) and 11.1% ai MH (potassium salt) FST-7 Leven-38	 3 gal 3 gal	12 H/ 7 D	Provides 2 lb ai MH/A and a 4% contact solution. Mix with 47 gal of water and apply approximately 50 gal/A to plants in early flower stage (one week after button) all day except when plants are wet or temperature exceeds 90°F with bright sunlight. Use 3 nozzles/row to deliver a coarse spray at 20–25 psi pressure targeted to the upper one-third of the plant. Do not apply within 7 days prior to harvest unless irrigation or rainfall will occur to minimize MH residues.
Contact-Contact-Localized-Systemic Mix	Fatty Alcohol C_6, C_8, C_{10}, and C_{12} alcohol mixture — FLUMETRALIN 1.2 lb/gal premix Plucker Plus	3 gal	12 H/ 7 D	Provides a 4% contact solution and 2 qt of a 1.2 lb/gal *flumetralin* when tank mixed with 47 gal of water. Apply approximately 50 gal/A to plants in early flower stage (one week after button) all day except when plants are wet or temperature exceeds 90°F with bright sunlight. Use three nozzles per row to deliver a coarse spray at 20–25 psi pressure targeted to the flower of the plant. This application should follow one or more applications of contact and may be followed by multiple contacts and possibly an application of MH for a total sucker control program.

CHEMICAL TYPE		CHEMICAL	FORMULATION RATE PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Contact-Localized-Systemic + or / Systemic Combination	Tank mixed	[*flumetralin* + MH] [Tankmixed] *flumetralin* 1.2 lb/gal + MH 1.5 lb/gal or MH 2.25lb/gal	2 qt + 1.5 gal or 1 gal	24 H/ 7 D	***FLUMETRALIN* (Drexalin Plus or Prime+) TANK MIXED WITH MH** *Flumetralin* may be tank mixed with the labeled rate of any MH product which does not specifically prohibit the tank mix in approximately 50 gal of water and applied as a contact to run down the stalk (approximately 50 gal solution per acre). Apply 5–7 days after the last application of Contact and after a majority of the plants have been topped. Direct spray at 20–25 psi into the top leaf axils of plants.
	Sequential	flumetralin 1.2 lb/gal + MH 1.5 lb/gal or MH 2.25lb/gal	2 qt + 1.5 gal or 1 gal	24 H/ 7 D	**SEQUENTIAL APPLICATION OF *FLUMETRALIN* (Drexalin Plus or Prime+) WITH MH** Mix 2 qt of *flumetralin* in 50 gal of water and apply either by handheld dropline nozzles or with powered spray equipment as a contact to run down the stalk. Timing of *flumetralin* should be during the elongated button to early flower stage of tobacco. Approximately 3–5 days after the *flumetralin* application, apply maleic hydrazide according to the label directions, precautions, and restrictions on that label.
Contact		Fatty alcohol 3%	1.5 gal	24 H/ 7 D	**NO MH SUCKER CONTROL PROGRAM, REPEATED CONTACTS WITH *FLUMETRALIN*** Apply multiple applications of contacts of increasing concentrations (3%, 4%, 5%) beginning when not more than 30–40% of the plants are in the early button stage and continuing on a 5–7 day schedule to control early suckers as they emerge and allow the upper plant leaves to more fully develop. Top plants that have flowered after each application. Apply 30–50 gal of a solution prepared by mixing 2 quarts of *flumetralin* OR 3 qts of *flumetralin* in 50 gal of water/A with droplines, jugs, or a power sprayer 3-5 days following the last contact application. Accuracy of control is improved with hand application using droplines or jugs, but increases the labor requirements. Apply as a contact to run down the stalk. Stalks must be standing straight for the most efficient control. An additional application of no more than 1 quart of *flumetralin* applied with a mechanical sprayer may improve long term control by treating leaf axils when applied 5–7 days after the initial *flumetralin* application. Additional applications of 5% contact solutions may be required on a 5–7 day schedule to provide additional control of missed suckers. Additional hand sucker removal may be required to prevent suckers from becoming unwanted foreign material in the harvested leaf.
Contact		Fatty alcohol 4%	2 gal	24 H/ 7 D	
Contact		Fatty alcohol 5%	2.5 gal	24 H/ 7 D	
Contact-Localized-Systemic		[Fatty alcohol 5% + *flumetralin*]	2.5 gal/2 qt	24 H/ 7 D	
Contact		Fatty alcohol 5%	2.5 gal	24 H/ 7 D	
Contact		Fatty alcohol 5%	2.5 gal	24 H/ 7 D	
(3-Way Tankmix)		[*flumetralin* + MH + contact] [3-way tank mix] [*flumetralin* (1.2 lb/gal) + MH (1.5 lb/gal) or MH (2.25 lb/gal) + contact]	2 qt + 1.5 gal or 1 gal + 2.5 gal	24 H/ 7 D	**3-WAY TANKMIX PROGRAM—*FLUMETRALIN* (Drexalin Plusw or Prime+) TANK MIXED WITH MH and CONTACT** *Flumetralin* may be tank mixed with the labeled rate of any MH product that does not specifically prohibit the tank mix. To provide additional control a 5% solution of any contact fatty alcohol product may be included by adding 2.5 gal of product for each 47.5 gal of total solution. Apply in approximately 50 gal of water/A as a contact to run down the stalk (approximately 50 gal solution/A). Apply the 3-way tank mix 5–7 days after the last application of contact and after a majority of the plants have been topped. Direct spray at 20–25 psi into the top leaf axils of plants. FST-7 or Leven-38 may be used in combination with *flumetralin* to provide MH and Contact material for the 3-Way Tankmix. Following label instructions will result in lower application rates of MH and contact than suggested above.

TOBACCO SUCKER CONTROL (Flue-Cured)

CHEMICAL TYPE	CHEMICAL	FORMULATION RATE PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Contact: Late Season Clean-Up	Fatty Alcohol (C_6, C_8, C_{10}, and C_{12} alcohol mixture) 85% Active Ingredient		24 H/ 7 D	Late season application (up to 3 weeks after MH or Contact-localized-systemic) of a 5% contact solution (2.5 gal in 47.5 gal water) may be useful in controlling late season sucker growth or suckers uncontrolled by previously applied materials. Use the three-nozzle arrangement described above. Care should be taken not to apply this solution in bright sunlight when the temperature is high or when tobacco is moisture stressed.
	(Various Brands) Fair 85 Off-Shoot T Sucker Plucker Royaltac-M	2.5 gal 2.5 gal 2.5 gal 2.5 gal		
	n-Decanol (C_{10}) 79% Active Ingredient Antak Fair-Tac Royaltac	 2.25 gal 2.25 gal 2.25 gal		C_{10} alcohols are long chain alcohols and are said to be "hotter" than the mixture of alcohols found in the other products. The rate is normally reduced 0.5% less than for the products that are mixtures of C_6, C_8, C_{10}, and C_{12} alcohols. Late season applications may be made to older growth which is less likely to be controlled by normal lower application concentrations.
Program Codes: Chemical types separated by a slash "/" symbol means chemical types are applied sequentially over time. Generally, a "/" means 3-5 or 5-7 days between application of listed chemical types.				

YELLOWING AGENT FOR FLUE-CURED TOBACCO

J. Michael Moore, Extension Agronomist—Tobacco

CHEMICAL TYPE	CHEMICAL	MOA	RATE PER ACRE	REI/PHI (Hour or Days)	REMARKS AND PRECAUTIONS
Yellowing Agent	*ethephon* Ethephon 2 2 lb/gal	5	4–8 qt	48 H/ 2 D	Use after second or third priming when remaining leaves are physiologically mature. **Directed Spray:** Mix the lower amount in 50–60 gal of water and apply on a warm, sunny day as a fine spray mist with drop nozzles that direct the spray so that all mature leaves are covered. This treatment may make determining which leaves to harvest a little difficult as the tips of some upper leaves may yellow more rapidly than the butts. Harvest all leaves with 20% or more yellowing. **Over the Top:** Use the higher rate in 40–60 gal of water for an acre of coverage. Apply to all remaining leaves on the stalk. Determining time of application requires some experience and some trial and error; therefore, use a test kit to treat a few plants and observe the results before treating the whole field. Harvest yellowed leaves when they reach desired degree of yellowness, usually within 24–72 hours. Harvest may be completed the day after treatment. Excessive delay in harvest may result in loss of yield and quality or leaf drop. Tobacco that is sufficiently mature when treated and that yellows prior to harvest may require an advanced curing schedule with reduced yellowing time. Close attention should be paid to the curing schedule. Do Not Use Surfactants.
	ethephon Mature XL 6 lb/gal	5	1.33–2.66 pt	48 H/ 2 D	
	ethephon Oskie 3 lb/gal	5	2–3 pt	48 H/ 2 D	
	ethephon Prep 6 lb/gal	5	1.33–2.66 pt	48 H/ 2 D	
	ethephon Super Boll 6 lb/gal	5	1.33–2.66 pt	48 H/ 2 D	
	ethephon Ethephon 6 6 lb/gal	5	1.33–2.66 pt	48 H/ 2 D	