

TOBACCO INSECT CONTROL

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Integrated pest management (IPM) is the ecological approach to pest control. It uses ALL suitable techniques to reduce pests below economic levels. It is not the intention of IPM to do away with chemicals. If anything, IPM is designed to protect chemicals from being lost or becoming ineffective.

When insect pest populations reach economic threshold levels, control measures must be taken. The ultimate line of defense against insect enemies is the use of chemicals. These control costs can be very expensive, but the cost of not controlling could be total crop destruction. With IPM, when chemicals are used, it is because they are necessary; facts replace hunches.

IPM is needed even in high cash crops such as tobacco. Indiscriminate use of insecticides destroys beneficial insects. This can cause minor or secondary pests to become major pests and major pests to reach serious levels earlier. Overuse of insecticides may also contribute to a resistance buildup by the pests and make control even harder.

In order to reduce selection pressure on any given active ingredient, we recommend that growers avoid using insecticides with the same mode of action on consecutive generations of a pest if multiple applications are required during a growing season. Rotation among insecticides with different modes of action is recommended. This will help to maintain the efficacy of labeled products. To help with selection of insecticides, modes of action of insecticides are indicating in the recommendations below using the classification defined by the Insecticide Resistance Action Committee (<http://www.irac-online.org>). A different number indicates a different mode of action.

Natural Control - This includes weather, beneficial insects, diseases, etc., and results in the death of most insect pests (sometimes as many as 95-97%). Perhaps as many as 50%, or even more, of the potential insect pests are destroyed by beneficial insects before they can do much damage to tobacco. Beneficial insects are very important.

Economic Threshold - This is a level at which a treatment would be profitable and a decision to treat should be made. Economic thresholds may be affected by such things as location, size of insects, presence of beneficials, time of growing season, stage of growth, and the size and condition of the tobacco plant. Economic thresholds are continually changing. When in doubt, consult with your county Extension agent.

Current economic thresholds are:

Tobacco budworms - Treat when four or more plants out of 100 (4%) are infested with budworms during the first 4 weeks after transplanting. After the fourth week and until plants have buttoned, treat when 10 or more plants out of 100 (10%) are infested. When using CU-263, you may be able to wait a little longer before treatment.

Tobacco hornworms - Treat when 10 or more worms (without parasite cocoons) are found per 100 plants (10%). Worms having white parasite cocoons eat much less, and more of these can be tolerated before treatment is required.

Aphids - Treat when 10% of the plants checked have 50 or more live aphids on at least one leaf.

Flea beetles - Treat when there is an average of three flea beetles per plant early in the season, when the tobacco is small, or an average of 20 flea beetles per plant late in the season, when the tobacco is large. Flea beetles are normally a problem only early in the season (shortly after transplanting) and late in the season (when the harvest of lower leaves moves the flea beetles up the stalk).

Cutworms - Treat when 10% of the plants checked show cutworm damage.

Scouting - Scouting tobacco for various pests was part of the Tobacco IPM program that began in Dillon County in 1979. The program expanded to Florence and Horry counties in 1982 and to Marion County in 1983. Private scouting began in 1984 and continues. Ultimately, we hope that all tobacco in this state will be scouted at least once a week for all crop pests, by trained scouts or by the growers.

THRIPS

Thrips are responsible for the transmission of tomato spotted wilt virus (TSWV) in tobacco. Thrips are very tiny insects, barely visible with the naked eye. Although there are many different kinds of thrips found on tobacco, only three of those species are capable of transmitting the disease. One of those, *Frankliniella fusca* (the tobacco thrips), is the most common thrips found on tobacco.

Transmission of the disease seems to be most common during a fairly short period of time early in the season. Insecticide applications to control the thrips seem to provide very little help in controlling the disease. By the time that the insecticide kills the thrips, they have already transmitted the disease. The application of Admire (or generic brands of imidacloprid) or Platinum insecticides prior to transplanting does provide some suppression of the disease.

APHIDS

For several years now, we have been seeing fewer green aphids and more red aphids, with the latter being more difficult to control. Some taxonomic work suggested that the aphid that we have had on tobacco for the past few decades was not the green peach aphid, *Myzus persicae*. A new species, the tobacco aphid (*Myzus nicotianae*), was described. We have now come full circle. Other taxonomists have looked at the situation and come to the conclusion that these are both the same species, the green peach aphid. The green peach aphid does come in both a red and green color form, with the red generally being more difficult to control.

Aphids secrete a sugary substance known as honeydew. Honeydew is sticky, and a perfect site for the development of sooty mold. Once honeydew and sooty mold are present on the leaves, they are nearly impossible to get off. As aphids molt, they leave their cast skins behind. I have received numerous calls from growers (by the way of the county agents) who complained of getting poor control of aphids with Orthene. When I examined the situation, what I found was tobacco leaves covered with cast skins, honeydew, and sooty mold. There were no live aphids. Orthene will kill the aphids, but it will not (nor will anything else) get rid of the cast skins and damage.

Tobacco that has been damaged by aphids will carry that damage all the way to the warehouse floor. Leaves will be thinner, black, and stuck together. The result is a mess. The tobacco is of very poor quality and, justifiably, brings a lower price. The way to avoid aphid damage to your tobacco is to control the aphids before they build up to such high numbers.

The red form of the green peach aphid is more difficult to control than the green form. Both Admire (and generic brands of imidacloprid) and Platinum used in the greenhouse will give excellent control of the red and green forms of the green peach aphid.

PRECAUTIONS USING INSECTICIDES

ALL insecticides should be applied according to label precautions and restrictions.

TOBACCO INSECT CONTROL IN THE PLANT BED

INSECT	PRODUCT {MODE OF ACTION GROUP}*	AMOUNT PER 1000 SQ FT	MIXING AND APPLICATION	REI
Aphids & Flea Beetles	Acephate (Orthene 97) {1B}	3/4 ** tbsp	Mix spray using 3/4 tbsp per 1 gal water/1000 sq ft.	24
Cutworms	Acephate (Orthene 97) {1B}	3/4 tbsp	Mix spray using 3/4 tbsp per 1 gal water/1000 sq ft.	24
Slugs or Snails	Metaldehyde 5B	2 lb	Scatter around margins, walkways, and open spaces in beds.	12

* Modes of action of insecticides are indicating using the classification defined by the Insecticide Resistance Action Committee (<http://www.irac-online.org>).

** tbsp = tablespoon

TOBACCO INSECT CONTROL IN GREENHOUSES OR IN TRANSPLANT WATER

Acephate (Orthene 97) is labeled for use on tobacco in greenhouses to control cutworms, flea beetles, the green peach aphid, and the tobacco aphid, at a rate of ¾ lb/A. Apply to foliage at the equivalent of 3/4 tbsp in 3 gal water/1000 sq ft of bed. Apply evenly to ensure thorough coverage. Note: Floatbed water should be disposed of in the transplanted field through the transplant water or through foliar spray.

Imidacloprid - Admire Pro has replaced Admire 2F. Both products have the same active ingredient (imidacloprid). However the Admire Pro formulation is more concentrated, therefore the rates will be different. It is labeled at 0.5 fl oz/1000 plants for aphids and flea beetles and 0.6-1.2 fl oz/1000 plants for mole crickets and wireworms. For tomato spotted wilt suppression, use 0.8-1.2 fl oz/1000 plants.

Admire 2F and generic brands are also labeled for use on tobacco as a drench to trays or flats prior to transplanting. Labeled rates are 1 fl oz/1000 plants for aphids and flea beetles and 1.4-2.8 fl oz/1000 plants for mole crickets and wireworms. Although this is a greenhouse application, imidacloprid will control these insects in the field for most of the growing season. For tomato spotted wilt suppression, use 1.8-2.8 fl oz/1000 plants.

Thiamethoxam (Platinum 2 SC) is labeled for use on tobacco as a drench to trays or flats prior to transplanting. It is labeled at 0.8-1.3 fl oz/1000 plants for aphids, flea beetles, and Japanese beetles, and 1.3 fl oz/1000 plants for wireworms. Although this is a greenhouse application, it is for control of these insects in the field. For tomato spotted wilt suppression, use 0.8-1.3 fl oz/1000 plants.

Cloranthraniliprole (Coragen) is labeled for use on tobacco as a drench to trays or flats prior to transplanting. It is labeled at 5.0-7.5 oz/ac for tobacco budworms and tobacco hornworms. Durivo (**Cloranthraniliprole** + **Thiamethoxam**) is labeled for use on tobacco as a drench to trays or flats prior to transplanting at rates of 0.6-1.6 oz/1,000 plants with combined activity of both insecticides.

Cyantraniliprole (Verimark) is labeled for use on tobacco as a drench to trays or flats prior to transplanting. It is labeled at 10-13.5 oz/ac for tobacco budworm, tobacco hornworm and flea beetle control, and at 13.5 oz/ac for tomato spotted wilt suppression.

An insecticidal soap, **M-Pede**, is also labeled for use on tobacco in the greenhouse. However, its effectiveness has not yet been established.

"ALL insecticides should be applied according to label precautions and restrictions."

TOBACCO INSECT CONTROL IN THE FIELD

INSECT	PRODUCT {MODE OF ACTION GROUP}*	AMOUNT PER ACRE	MIXING AND APPLICATION	REI (hrs)
WIREWORMS	Ethoprop (Mocap 15 G [R]) {1B}	13 lb	Broadcast granules with spreader or apply sprays evenly over area at least 7-10 days before transplanting and disc to mix 2-4 inches into soil.	48
	Imidacloprid (Admire Pro) {4A}	0.6-1.2 fl oz/ 1000 plants	Apply as a drench to flats or trays prior to transplanting.	12
	Imidacloprid (Admire Pro) {4A}	0.8-1.2 fl oz/ 1000 plants	Apply in transplant water in a minimum of 100 gal/A.	12
	Imidacloprid (Admire 2F and generic brands) {4A}	1.4-2.8 fl oz/ 1000 plants	Apply as a drench to flats or trays prior to transplanting.	12
	Imidacloprid (Admire 2F and generic brands) {4A}	1.8-2.8 fl oz/ 1000 plants	Apply in-furrow or transplant water.	12

TOBACCO INSECT CONTROL IN THE FIELD (cont)

INSECT	PRODUCT {MODE OF ACTION GROUP}*	AMOUNT PER ACRE	MIXING AND APPLICATION	REI (hrs)
WIREWORMS (CONT)	Thiamethoxam (Platinum 2 SC) {4A}	1.3 fl oz/ 1000 plants	Apply as a drench to flats or trays prior to transplanting, or in transplant water in a minimum of 100 gal/A.	12
	Thiamethoxam and chlorantraniliprole (Durivo) {4A} {28}	1.6 fl oz/ 1000 plants	Apply at transplant.	-
APHIDS	Acephate (Orthene 97) {1B}	0.5 lb	Apply in 10-50 gal spray/A for complete coverage or in transplant water in a minimum of 100 gal/A. PHI = 3 days	24
	Imidacloprid (Admire Pro) {4A}	0.5 fl oz/ 1000 plants	Apply as a drench to flats or trays prior to transplanting.	12
	Imidacloprid (Admire Pro) {4A}	0.6 fl oz/ 1000 plants	Apply in transplant water in a minimum of 100 gal/A.	12
	Imidacloprid (Admire 2F and generic brands) {4A}	1.0 fl oz/ 1000 plants	Apply as a drench to flats or trays prior to transplanting.	12
	Imidacloprid (Admire 2F and generic brands) {4A}	1.4 fl oz/ 1000 plants	Apply in-furrow or transplant water.	12
	Imidacloprid (Provado 1.6 F) {4A}	2-4 oz	Apply in 20-40 gal spray/A for complete coverage. PHI = 14 days	12
	Lambda-cyhalothrin/ chlorantraniliprole (Besiege) {3A} {28}	5-9 oz	Use at least 10 gal spray/ac. PHI = 40 days (suppression only)	12
	Methomyl (Lannate LV [R] or SP [R]) {1A}	1.5 pts or 0.5 lbs.	Apply in 20-40 gal spray/A for complete coverage. PHI = 5 days	48
	Pymetrozine (Fulfill 50 WG) {9B}	2.75 oz	Same as above. Do not make more than two applications per season.	12
	Thiamethoxam (Platinum 2 SC) {4A}	0.8-1.3 fl oz/ 1000 plants	Apply as a drench to flats or trays prior to transplanting, or in transplant water in a minimum of 100 gal/A.	12
	Thiamethoxam (Actara) {4A}	2-3 oz	Use at least 20 gal spray/ac. PHI = 14 days.	12
	Thiamethoxam and chlorantraniliprole (Durivo) {4A} {28}	0.6-1.6 fl oz/ 1000 plants	Apply at transplant.	-
	Thiamethoxam/ chlorantraniliprole (Voliam Flexi) {4A} {28}	2.5-4 oz	Use at least 20 gal spray/ac. PHI=14 days	12

TOBACCO INSECT CONTROL IN THE FIELD (cont)

INSECT	PRODUCT {MODE OF ACTION GROUP}*	AMOUNT PER ACRE	MIXING AND APPLICATION	REI (hrs)
FLEA BEETLES	Acephate (Orthene 97) {1B}	0.5 lb	Apply in 20-40 gal spray/A for complete coverage or in transplant water in a minimum of 100 gal/A. PHI = 3 days	12
	Carbaryl (Sevin 80S or 4F) {1A}	1.25-2.5 lb 1-2 qt	Apply in 20-40 gal spray/A for complete coverage. PHI = 0	12
	Cyantraniliprole (Exirel)	13.5-20.5 oz	foliar application (PHI = 7 days)	12
	Cyantraniliprole (Verimark)	10-13.5 oz	Transplant water or greenhouse tray drench	4
	Imidacloprid (Admire Pro) {4A}	0.5 fl oz/ 1000 plants	Apply as a drench to flats or trays prior to transplanting.	12
	Imidacloprid (Admire Pro) {4A}	0.6 fl oz/ 1000 plants	Apply in transplant water in a minimum of 100 gal/A.	12
	Imidacloprid (Admire 2F and generic brands) {4A}	1.0 fl oz/ 1000 plants	Apply as a drench to flats or trays prior to transplanting.	12
	Imidacloprid (Admire 2F and generic brands) {4A}	1.4 fl oz/ 1000 plants	Apply in-furrow or transplant water.	12
	Imidacloprid (Provado 1.6 F) {4A}	4 oz	Apply in 20-40 gal spray/A for complete coverage. PHI = 14 days	12
	Methomyl (Lannate LV [R] or SP [R]) {1A}	0.75-1.5 pts or 0.25-0.5 lbs	Apply in 20-40 gal spray/A for complete coverage. PHI = 5 days	48
	Thiamethoxam (Platinum 2 SC) {4A}	0.8-1.3 fl oz/ 1000 plants	Apply as a drench to flats or trays prior to transplanting, or in transplant water in a minimum of 100 gal/A.	12
	Thiamethoxam (Actara) {4A}	2-3 oz	Use at least 20 gal spray/ac. PHI = 14 days.	12
	Thiamethoxam and chlorantraniliprole (Durivo) {4A} {28}	1.0-1.6 fl oz/ 1000 plants	Apply at transplant.	-
	Thiamethoxam/chlorantraniliprole (Voliam Flexi) {4A} {28}	2.5-4 oz	Use at least 20 gal spray/ac. PHI=14 days	12

TOBACCO INSECT CONTROL IN THE FIELD (cont)

INSECT	PRODUCT {MODE OF ACTION GROUP}*	AMOUNT PER ACRE	MIXING AND APPLICATION	REI (hrs)
BUDWORMS	Acephate (Orthene 97) {1B}	0.75 lb	Apply in 20-40 gal spray/A for complete coverage or in transplant water in a minimum of 100 gal/A. PHI = 3 days	12
	Bacillus Thuringiensis** {11}	(see label)		
	Bacillus Thuringiensis {11}	5-10 lb	Commercially prepared bait. Place small pinch in bud of each plant with a gloved hand or mechanical applicator.	Bait
	Chlorantraniliprole (Coragen) {28}	3.5-7.5 oz 5.0-7.5 oz	foliar application (PHI = 1 day) transplant water application at planting	4
	Cyantraniliprole (Exirel)	10-20.5 oz	foliar application (PHI = 7 days)	12
	Cyantraniliprole (Verimark)	10-13.5 oz	Transplant water or greenhouse tray drench	4
	Lambda-cyhalothrin (Karate Z) {3A}	0.96-1.92 oz	At least 2 gallons per acre. PHI = 40 days.	24
	Lambda-cyhalothrin/ chlorantraniliprole (Besiege) {3A} {28}	5-9 oz	Use at least 10 gal spray/ac. PHI = 40 days	12
	Methomyl (Lannate LV [R] or SP [R]) {1A}	1.5 pts or 0.5 lbs.	Use at least 10 gal spray/ac. PHI = 5 days	48
	Spinosad (Blackhawk){5}	1.6-3.2 oz	Use at least 20 gal spray/ac. PHI = 3 days.	4
	Thiamethoxam and chlorantraniliprole (Durivo) {4A} {28}	1.6 fl oz/ 1000 plants	Apply at transplant.	-
	Thiamethoxam/ chlorantraniliprole (Voliam Flexi) {4A} {28}	4 oz	Use at least 20 gal spray/ac. PHI=14 days	12

TOBACCO INSECT CONTROL IN THE FIELD (cont)

INSECT	PRODUCT {MODE OF ACTION GROUP}*	AMOUNT PER ACRE	MIXING AND APPLICATION	REI (hrs)
 <p>HORNWORMS</p>	Acephate (Orthene 97) {1B}	0.5 lb	Apply in 20-40 gal spray/A for complete coverage or in transplant water in a minimum of 100 gal/A. PHI = 3 days	12
	Bacillus Thuringiensis** {11}	(see label)		
	Carbaryl (Sevin 80S or 4F) {1A}	1.25-2.5 lb 1-2 qt	Apply in 20-40 gal spray/A for complete coverage. PHI = 0	12
	Chlorantraniliprole (Coragen) {28}	3.5-7.5 oz 5.0-7.5 oz	foliar application (PHI = 1 day) transplant water appl. at planting	4
	Cyantraniliprole (Exirel)	13.5-20.5 oz	foliar application (PHI = 7 days)	12
	Cyantraniliprole (Verimark)	10-13.5 oz	Transplant water or greenhouse tray drench	4
	Lambda-cyhalothrin (Karate Z) {3A}	0.96-1.92 oz	At least 2 gallons per acre. PHI = 40 days.	24
	Lambda-cyhalothrin/ chlorantraniliprole (Besiege) {3A} {28}	5-9 oz	Use at least 10 gal spray/ac. PHI = 40 days	12
	Methomyl (Lannate LV [R] or SP [R]) {1A}	0.75-1.5 pts 0.25-0.5 lbs	Use at least 10 gal spray/ac. PHI = 5 days	48
	Spinosad (Tracer or Blackhawk){5}	1.4-2.9 oz or 1.6-3.2 oz	Use at least 20 gal spray/ac. PHI = 3 days.	4
	Thiamethoxam and chlorantraniliprole (Durivo) {4A} {28}	1.6 fl oz/ 1000 plants	Apply as a drench to flats or trays prior to transplanting.	-
HORNWORMS (cont.)	Thiamethoxam/ chlorantraniliprole (Voliam Flexi) {4A} {28}	4 oz	Use at least 20 gal spray/ac. PHI=14 days	12
 <p>LOOPERS</p>	Acephate (Orthene 97) {1B}	0.75 lb	Apply in 20-40 gal spray/A for complete coverage or in transplant water in a minimum of 100 gal/A. PHI = 3 days	12
	Bacillus thuringiensis** {11}	(see label)		
	Methomyl (Lannate LV [R] or SP [R]) {1A}	1.5 pts 0.5 lbs	Use at least 10 gal spray/ac. PHI = 5 days.	48

TOBACCO INSECT CONTROL IN THE FIELD (cont)

INSECT	PRODUCT {MODE OF ACTION GROUP}*	AMOUNT PER ACRE	MIXING AND APPLICATION	REI (hrs)
GRASSHOPPERS	Acephate (Orthene 97) {1B}	0.25-0.5 lb	Apply in 20-40 gal spray/A for complete coverage or in transplant water in a minimum of 100 gal/A. PHI = 3 days	12
STINK BUGS 	Acephate (Orthene 97) {1B}	0.5-0.75 lb	Apply in 20-40 gal spray/A for complete coverage or in transplant water in a minimum of 100 gal/A. PHI = 3 days	12
	Chlorantraniliprole (Coragen) {28}	3.5-7.5 oz	foliar application. PHI = 1 day	4
JAPANESE BEETLES 	Carbaryl (Sevin 80S or 4F) {1A}	1.25-2.5 lb 1-2 qt	Apply in 20-40 gal spray/A for complete coverage. PHI = 0	12
	Acephate (Orthene 97) {1B}	0.75 lb	Apply in 20-40 gal spray/A for complete coverage or in transplant water in a minimum of 100 gal/A. PHI = 3 days	12
	Imidacloprid (Provado 1.6 F) {4A}	4 oz	Apply in 20-40 gal spray/A for complete coverage. PHI = 14 days	12
	Thiamethoxam (Actara) {4A}	2-3 oz	Use at least 20 gal spray/ac. PHI = 14 days.	12
	Thiamethoxam (Platinum 2 SC) {4A}	0.8-1.3 fl oz/ 1000 plants	Apply as a drench to flats or trays prior to transplanting, or in transplant water in a minimum of 100 gal/A.	12
	Thiamethoxam/ chlorantraniliprole (Voliam Flexi) {4A} {28}	2.5-4 oz	Use at least 20 gal spray/ac. PHI=14 days	12
CUTWORMS 	Chlorpyrifos (Lorsban 15 G or 4 E [R]) {1B}	13.5 lb or 2 qt	Apply as preplant broadcast granules or a preplant broadcast spray in not less than 10 gal spray/A. Incorporate into soil 2-4 inches. CAUTION: Do NOT apply to foliage.	24
	Acephate (Orthene 97) {1B}	0.75 lb	Apply in 20-40 gal spray/A for complete coverage or in transplant water in a minimum of 100 gal/A. PHI = 3 days	12
VEGETABLE WEEVILS 	Acephate (Orthene 97) {1B}	0.5 to 0.75 lb	Apply in 20-40 gal spray/A for complete coverage or in transplant water in a minimum of 100 gal/A. PHI = 3 days	12

* Modes of action of insecticides are indicating using the classification defined by the Insecticide Resistance Action Committee (<http://www.irac-online.org>).

** *Bt* products labeled for use on tobacco in South Carolina include Dipel, Biobit, Thuricide, MVP, Lepinox and Agree.

ON-FARM CONTROL OF TOBACCO MOTH AND CIGARETTE BEETLE

INSECTICIDE	DOSAGE	HOW, WHERE, AND WHEN TO APPLY
<p>Heat treatment</p> <p>Tobacco moth and Cigarette beetle (all stages)</p>	<p>140°F</p> 	<p>Hang in barn for a few hours.</p> <p>CAUTION: Tobacco must be thoroughly dried at temperature below 100°F before increasing temperature or color will change and result in decreased price.</p>
<p>Dichlorvos (Vapona) Resin strips {1B}</p> <p>Tobacco moth (moth only)</p>	<p>1 per 1,000 cu ft of space</p>	<p>Effective in reasonably tight storage facilities. Hang one resin strip per 1,000 cu ft of storage space. Replace if live moths are noticed.</p>
<p>Bacillus thuringiensis* {11}</p> <p>Tobacco moth (larvae only)</p>	<p>(see label)</p> 	<p>Apply as a fine mist. Spray leaves in layers as tobacco is being sheeted, re-sheeted, or placed in a pile for storage. Good coverage is essential.</p> <p>CAUTION: Avoid excessive moisture.</p>

*The only Bt product labeled for this use in South Carolina is Dipel.