2025 Louisiana Field Crops Insect Pest Management Guide

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Should the registration of a herbicide or certain uses of a herbicide be canceled by federal or state agencies, suggestions thus affected herein are no longer applicable. Use of products in this guide does not constitute a guarantee or warranty of the products named and does not signify that these products are approved to the exclusion of comparable products.

Cover photo by James Villegas, Assistant Professor, IPM Coordinator, Extension – Field Crops Entomologist, LSU AgCenter Dean Lee Research and Extension Center

Introduction

The Insect Pest Management Guide is issued annually by the LSU AgCenter. Each edition supersedes guides for all prior years. Visit www.LSUAgCenter.com for the latest information. Call 225-578-1634 with questions about insects and arthropods and their management of them. You may also contact your county agent.

Insecticide recommendations and rates of application listed in this guide are in conformance with U.S. Environmental Protection Agency registrations and U.S. Food and Drug Administration tolerances.

Users of this guide should still read the label on the insecticide container and follow the directions and precautions on the label carefully when using the insecticides recommended in this guide.

Some insecticides registered by the U.S. Environmental Protection Agency are not included in this guide for a variety of reasons, such as their hazardous nature, lack of availability, inefficient control of pests, or higher costs for use.

Restricted Use Pesticides

Some of the pesticides or certain uses of pesticides in this publication may be classified for restricted use. The labels of those pesticides with restricted uses will contain information regarding these restrictions. Be sure to read all labels thoroughly. It is illegal to use any pesticide in a manner that is inconsistent with the label directions. Information on pesticide applicator certification programs may be obtained from the LSU AgCenter.

General Information for Users of This Guide

The following pest control recommendations are based on research conducted by LSU AgCenter faculty members in its Louisiana Agricultural Experiment Station and Louisiana Cooperative Extension Service in cooperation with the U.S. Department of Agriculture.

Pest control recommendations made by LSU AgCenter faculty are based on materials for which there is specific information regarding effectiveness under Louisiana conditions, residues that will remain on the crop at harvest, phytotoxicity, and effects on beneficial predators, parasites, honeybees, fish, and other wildlife. In addition, environmental effects, particularly as each pesticide relates to water, are strongly considered. Recommended chemicals also must be registered and labeled for use by both the Environmental Protection Agency and the Louisiana Department of Agriculture and Forestry.

New materials and formulations will be included in the recommendations only after they have been properly registered, have proven effective, and have shown the registered use will not result in a residue that exceeds the legal tolerance when applied as directed under Louisiana conditions.

These suggestions for pest control are based on the best information available for each pesticide listed. If followed carefully, they should result in satisfactory control and should not leave residues that exceed the tolerance established for any chemical on a particular crop. To avoid excessive residues on the harvested crop, follow directions carefully with respect to dosage levels, the number of applications, and the minimum interval between application and harvest. Always be sure to observe the waiting period for re-entry into the field after a pesticide application if such a period is stated on the label. Also, wear any protective clothing or devices specified on the label for applying pesticides or entry into a treated field.

The grower is responsible for residues on his or her crop as well as for problems caused by drift from the grower's property to other properties or crops.

General Precautions

All pesticides are poisonous and should always be used with caution. The following suggestions for using and handling pesticides will help minimize the likelihood of injury to humans, animals, and crops from exposure to the chemicals.

1. Always read all the label's precautionary directions before using pesticides and follow those directions exactly. Notice warnings and cautions before opening the containers. Repeat the process every time no matter how often you use a pesticide or how familiar you think you are with the directions. Apply the pesticide only in amounts and at times specified.
2. Keep pesticides out of reach of children, pets, irresponsible individuals, and livestock. Pesticides should be stored outside the house, away from food and feed, and under lock and key.
3. Always store pesticides in their original containers and keep containers tightly closed. Never keep pesticides in anything but the original containers with legible labels.
4. Never smoke or eat while applying pesticides.
5. Avoid inhaling sprays or dust. When directed on the label, wear protective clothing and an approved mask.
6. Should pesticides be accidentally spilled on the skin or clothing, remove contaminated clothing immediately and wash the contaminated skin thoroughly.
7. Bathe and put on clean clothing after spraying or dusting. If it is not possible to bathe, wash hands and face thoroughly and change clothes. Also, wear fresh clothing each day.
8. Cover food and water containers when treating in or around livestock or pet areas. Do not contaminate fishponds, streams, or lakes.
9. Do not reuse pesticide containers for any purpose.
10. Observe label directions and follow recommendations to keep the residue on edible portions of plants within the limits permitted by law.
11. If symptoms of illness occur during or shortly after dusting or spraying, call a physician or get yourself or the affected person to a hospital immediately. Also, bring a label from the container of pesticide that was used to the doctor or hospital.
12. Do not use the mouth to siphon liquids from containers or blow out clogged lines, nozzles, etc.

13. Do not spray with leaking hoses or connections.
14. Do not work in the drift of a spray or dust.
15. Confine pesticides to the property being treated. Avoid drift to adjacent properties by stopping treatment if weather conditions become unfavorable.
16. Do not apply pesticides over waterways or canals, and do not apply them to a field while it is being irrigated or if water runs off a field.
17. If laborers are working in crops with heavy foliage, such as cotton, tomatoes, peaches, citrus, etc., that have been treated with highly toxic compounds, be sure the recommended interval between the treatment and entrance into the treated area is observed. These workers should follow the same precautions given to applicators regarding clothing changes, wearing protective clothing, eating, smoking, and bathing. If a worker becomes ill while working under these conditions, call a physician immediately.

Insecticide/Acaricide Resistance Management

The insecticides recommended in this publication are important components of an integrated pest management plan. If the insecticides are not used properly, or if they are used repeatedly over time, there is a possibility that resistance to those insecticides will develop.

It is the responsibility of the producer or pesticide applicator to conserve the use of insecticides. It is important that insecticides with different mode-of-action classifications be rotated during a season. An insecticide's mode of action defines how a specific pesticide kills an insect or mite. Repeated use of pesticides with the same mode of action often will result in the development of resistance to the entire class of insecticides.

Resistance to insecticides may be defined as "a heritable change in the sensitivity of a pest population that is reflected in the repeated failure of a product to achieve the expected level of control when used according to the label recommendations for that pest species," according to the Insecticide Resistance Action Committee. Once an insect population becomes resistant to a class of insecticides, the entire class can no longer be used to manage the target insect.

While using this pest control guide, please be sure to refer to the IRAC MoA (mode of action) classifications in the final table in this publication. Be sure to keep records of the insecticides you use during the season to control pests in your crop. We encourage you to practice pesticide stewardship and rotate insecticides used during the season based on the mode-of-action classifications.

Pesticide Drift

Pesticide drift is by far the most important cause of illegal residues on forage crops. No pesticide can be applied by either aerial or ground equipment without some drift occurring. Drift can be kept to a minimum (and therefore the contamination of forage crops reduced) if certain precautions are observed. Those precautions involve the selection of the pesticide, method of application, type of formulation (dust, spray, or granular), timing of treatment, wind direction and velocity, and distance between the point of application, and the nearest forage crop downwind.

Pesticides Hazardous to Honeybees and Other Beneficial Insects

Many pesticides are highly toxic to honeybees and other beneficial insects. Farmers, beekeepers, and the pest control industry should cooperate closely to keep losses of beneficial insects to a minimum.

Certain pesticides are more toxic than others to these insects. Therefore, whenever possible, use the least toxic material.

When bees are present, the safest time and method of application of pesticides should be employed. Avoid the drift of pesticides onto bee colonies or nearby crops and weeds in bloom. Do not contaminate bee drinking water.

New label statements to protect bees have been added to some labels (neonicotinoids in particular). Read and follow these statements.

Wildlife Hazards

To protect fish and other wildlife, do not apply pesticides over canals or streams, and do not allow drainage from treated fields to enter waterways immediately after application.

Pesticide Phytotoxicity

Certain chemicals may cause plant injury if used at the wrong stage of plant development or when the temperature is too high. The injury also may result when excessive dosage rates, wrong formulations, or incompatible pesticide combinations are applied. To avoid plant injury, follow recommendations precisely.

Buffers/Water pH

Water pH is a critical factor in the effectiveness of most insecticides. Since most insecticides are acid-formers, it is critical that your water pH be acidic to prevent chemical breakdown, known as hydrolysis.

The optimum pH is between 5.5 and 6.5. The best way to correct a high water pH is with a buffer because it will establish the pH so it will not fluctuate with changes in temperatures.

The water pH can be measured using a swimming pool test kit, litmus paper, or a pH meter. Use what will work best for you. Water pH is affected by temperature, sunlight, rainfall, drought, and many other factors and is seldom the same from one spray to the next. Thus, check the water pH before each spray.

Several buffers are on the market that are about equal in efficiency. Use the one available to you. You should test the effectiveness of the buffer by using 1 to 2 ounces per 50 gallons of water and then mixing and rechecking the pH. Whatever is dissolved in the water will determine how much buffer you may need. The label may say one quart, but you may need less or occasionally more.

Check each time and start with about 2 ounces per 50 gallons of water. Then add 1 ounce at a time until the correct pH is reached. Too much of a buffer will cause the water to be too acidic, which can be phytotoxic to your plants.

Buffers help to enhance the initial knockdown of your spray and give you better residual effects. That will, in the long term, reduce the number of sprays you make. Reducing the number of sprays will reduce the development of pest tolerance, harm to the environment, effects on beneficial insects (saving beneficials), and costs while also helping you to produce a good crop.

Oils as Pesticides

Oil may be used to control many pest populations of insects and mites. They may be used alone or in combination with insecticides or miticides. Oils may be used year-round simply by varying the rates for the seasons.

Examples include dormant oil, Volck oil, Superior oil, Sun Spray Ultra Fine oil, and others. Some oils can be used on a wide variety of crops such as fruits, vegetables, ornamentals, trees, flowers, and foliage plants. Others may be limited. Follow the label for proper control.

Predators and Parasites

The use of beneficial insects or predators to control pest populations is a natural phenomenon. Parasites and predators usually build up once a pest or host becomes established. In some cases, these naturally occurring controls effectively maintain pest numbers below economic thresholds.

As pest density increases, it initiates the development of the “beneficials.” Beneficial insects, however, can be purchased to supplement the natural beneficials and enhance control, thereby reducing the need for pesticide use. Beneficials always should be purchased in either the egg or immature stage to help ensure the desired control. Some adults can fly off to other areas.

Some beneficials can become a nuisance if numbers become too dense. Such a problem developed in areas with the Asian lady beetle. Another example is the small braconid wasp that will infest catalpa worms when released to control hornworms in vegetables and tobacco.

Restricted Entry Intervals (REIs)

Read the agricultural use requirements on the label very carefully to determine the restricted entry interval for a particular use of an insecticide. The restricted entry intervals may vary for different uses of the same insecticide. ALWAYS READ THE LABEL!

In Case of Poisoning

Louisiana (Nationwide) Toll-Free Poison Center
800-222-1222

24-Hour-a-Day Service
National Pesticide Information Center
800-858-7378
(800-858-PEST)
Monday-Friday, 8 a.m.-12 p.m. (Pacific Time)
www.npic.orst.edu

Pesticide Spills and Hazardous Material Cleanup
855-452-5323

Read the Pesticide Label for Your Area/Use

Louisiana State Arthropod Museum Insect and Spider Identification Services

See https://www.lsu.edu/lmnh/lsam.php for information.

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Disclaimer Statement

The pesticides recommended in this publication were registered for prescribed uses at the time of publication. Pesticide registrations are reviewed continuously. When the registration for a recommended pesticide is canceled, the LSU AgCenter no longer recommends that pesticide.

Uses of brand or trade names in this publication are for clarity and information. Such use does not imply approval of the product to the exclusion of others that may be of similar suitable composition, and it does not guarantee or warrant the standard of any given product. The lists of products provided in this publication are not intended to cover all available products.

All insecticides must be used as instructed on their labels. Most insecticides are registered for insects on particular commodities. It is a violation of federal law to use any insecticide for an insect or commodity for which it is not labeled.

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Crops - Commercial

Cotton

Cotton – Pre-bloom

Table 1. Bollworm/tobacco budworm

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold/Remarks
indoxacarb Steward (1.25)	11.3 ounces	0.11	11.5	• Non-Bt and BG2 cotton varieties: Treat when population reaches or exceeds 8 larvae (regardless of size) per 100 plants or 6% fruit injury of any kind. • WideStrike 3, TwinLink Plus, and BG3 cotton varieties: Treat when population reaches or exceeds 8 larvae (1/8 inch or longer) per 100 plants or 6% fruit injury of any kind. • Premix insecticides are available for this pest. See premix table.
spinosad Blackhawk (0.36)	2.4-3.2 ounces	0.054-0.072	6.7-5.0	
chlorantraniliprole Vantacor (5)	1.2-2.5 ounces	0.047-0.098	106.7-51.2	

Table 2. Cutworms

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold/Remarks
esfenvalerate Asana XL (0.66)	5.8 ounces	0.03	22	• Treat when loss of satisfactory stand is threatened or in minimum tillage environment. • Premix insecticides are available for this pest. See premix table.
beta-cyfluthrin Baythroid XL (1)	0.8 ounce	0.007	160	
bifenthrin Brigade (2)	2.6-6.4 ounces	0.04-0.10	20.0-50.0	
cyfluthrin Tombstone (2)	0.8 ounce	0.013	154	
lambda-cyhalothrin Warrior II (2.08)	0.9-1.3 ounces	0.015-0.02	142.0-98.0	
z-cypermethrin Mustang Max (0.8)	1.3-2.8 ounces	0.01-0.017	80.0-47.0	
gamma-cyhalothrin Declare (1.25)	0.77-1.02 ounces	0.0075-0.01	166.0-125.0	
a-cypermethrin Fastac (0.83)	1.3-1.9 ounce	0.008-0.012	80.0-67.0	

Table 3. Plant bugs

cotton fleahopper, clouded, or tarnished

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold/Remarks
flonicamid Carbine (50)	2.3-2.8 ounces	0.072-0.089	7.0-8.0	• Treat when 10 to 25 of these pests per 100 sweeps are found. • Adjust pre-bloom treatment levels to maintain between 70% and 85% first position square retention. • Control of cotton fleahoppers can usually be obtained with lower rates than the rates used to control other plant bug pests. • Multiply clouded plant bug number by 1.5 when determining densities for treatment decision. • Premix insecticides are available for this pest. See premix table. NOTE: Diamond will not control adults. For adult control, tank mix with an adulticide. Repeat applications at 7- to 14-day intervals as needed to maintain control.
thiamethoxam Centric (40)	2.5-3.0 ounces	0.0625-0.075	6.4-5.3	
imidacloprid Admire Pro (4.6)	0.9-1.7 ounces	0.032-0.062	142.0-75.0	
imidacloprid (2)	2.0-4.0 ounces	0.032-0.062	64.0-32.0	
imidacloprid (4)	2.0 ounces	0.063	64	
acetamiprid Strafer Max (70)	1.7-2.3 ounces	0.075-0.10	9.4-7.0	
sulfoxaflor Transform (50)	1.5-2.25 ounces	0.047-0.071	10.7-7.1	
clothianidin Belay (2.13)	3.0-6.0 ounces	0.05-0.1	42.7-21.0	
oxamyl Vydate C-LV (3.77)	11.2-17.0 ounces	0.33-0.50	11.4-7.5	
novaluron Diamond (0.83)	6.0-12.0 ounces	0.039-0.078	21.3-10.6	

Table 4. Spider Mites

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold / Remarks
abamectin (0.15) Agri-Mek (0.15)	8.0-16.0 ounces	0.009-0.0187	16.0-8.0	• Treat when mite infestations cause areas where plants have discolored leaves. • Anticipate repeating applications in 5 days. • Premix insecticides are available for this pest. See premix table.
fenpyroximate Portal (0.4)	16.0-32.0 ounces	0.05-0.10	8.0-4.0	
spiromesifen Oberon (4)	4.0-8.0 ounces	0.0625-0.125	32.0-16.0	
etoxazole Zeal (72)	0.66-1.0 ounces	0.030-0.045	28.0-16.0	
abamectin Agri-Mek SC (0.7)	1.75-3.5 ounces	0.009-0.019	73.1-36.6	
hexythiazox Onager (1)	16.0-20.0 ounces	0.125-0.156	8.0-6.4	

Table 5. Thrips - Seed Treatment

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold / Remarks
acephate Orthene (90)	6.4 ounce/100 wt	See label.	See label.	Seed Treatment • Use Acephate With Caution: Pockets of acephate-resistant thrips have been detected in portions of Louisiana.
Imidacloprid Gaucho Grande (600)	0.375 mg AI/seed	See label.	See label.	
Avicta Elite	Commercial pre-treatment of imidacloprid + thiamethoxam	See label.	See label.	
Aeris	Commercial pre-treatment of imidacloprid+ thiodicarb	See label.	See label.	

Table 6. Thrips - At Planting

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold / Remarks
acephate Orthene (90)	1.1 pound	1	See label.	At planting in-furrow • Use Acephate With Caution: Pockets of acephate-resistant thrips have been detected in portions of Louisiana. • Premix insecticides are available for this pest. See premix table.
aldicarb AgLogic (15)	3.3-5.0 pounds	0.5-0.75	See label.	
imidacloprid Admire Pro (4.6)	7.4-9.2 ounces	0.26-0.33	See label.	
Imidacloprid (4)	8.5-10.6 ounces	0.25-0.33	See label.	
Imidacloprid (2)	17.0-21.1 ounces	0.25-0.33	See label.	

Table 7. Thrips - Foliar Spray

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold / Remarks
acephate Orthene (90)	3.2 ounces	0.18	5	Foliar Spray • Use Acephate With Caution: Pockets of acephate-resistant thrips have been detected in portions of Louisiana. • Treat when immature thrips first appear on seedling cotton before the fourth true leaf. Do not apply acephate/Orthene if spider mites are present. • Spray is not necessary when utilizing ThryvOn cotton. • Premix insecticides are available for this pest. See premix table
acephate Orthene (97)	3.0 ounces	0.18	5.3	
dicrotophos Bidrin (8)	3.2 ounces	0.2	40	
dimethoate Dimethoate (4)	6.4 ounces	0.2	20	
spinetoram Radiant (1)	1.5-3.0 ounces	0.01-0.02	85.0-42.7	

Cotton – Bloom to Harvest

Table 8. Beet armyworms

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold/Remarks
methoxyfenozide Intrepid (2)	6.0-10.0 ounces	0.09-0.16	21.0-12.5	• Treat when larvae are small and five to six hatch out spots (hits) are observed per 300-row feet. • Premix insecticides are available for this pest. See premix table.
indoxacarb Steward (1.25)	11.3 ounces	0.11	11.5	
spinosad Blackhawk (0.36)	2.4-3.2 ounces	0.054-0.072	6.7-5.0	
chlorantraniliprole Vantacor (5)	1.2-2.5 ounces			
bifenthrin, chlorantraniliprole Elevest	5.6-9.6 ounces	premix	22.8-13.3	

Table 9. Bollworm/tobacco budworm

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold/Remarks
spinetoram Radiant (1)	2.8-8.0 ounces	0.022-0.0625	46-16	• Non-Bt and BG2 varieties: Treat when you find 20 eggs per 100 plants or 6% fruit injury of any kind. Regardless of the size of larvae, treatment may be warranted if damaged-boll counts exceed 2% and significant numbers of larvae are present and continuing to cause damage. • WideStrike 3, TwinLink Plus, and BG3 cotton varieties: Treat when larvae 1/8-inch or longer exceed four larvae per 100 plants or 6% fruit injury of any kind. Regardless of the size of the larvae, treatment may be warranted if damaged-boll counts exceed 2% and significant numbers of larvae are present and continuing to cause damage. • Use Pyrethroids With Caution: Pyrethroid resistance is prevalent in bollworms in Louisiana. • Premix insecticides are available for this pest. See premix table.
indoxacarb Steward (1.25)	11.3 ounces	0.11	11.5	
spinosad Blackhawk (0.36)	2.4-3.2 ounces	0.054-0.072	6.7-5.0	
chlorantraniliprole Vantacor (5)	1.2-2.5 ounces	0.047-0.098	106.7-51.2	
bifenthrin, chlorantraniliprole Elevest	5.6-9.6 ounces	premix	22.8-13.3	

Table 10. Brown stink bugs

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold/Remarks
acephate Orthene (90)	0.8 pound	0.72	1.25	• Treat stink bugs when 1 adult/nymph is found per 6 row feet, 5% adults/nymphs are found in sweep nets, or 15% to 20% of 12- to 16-day old bolls have internal injury. • Premix insecticides are available for this pest. See premix table.
dicrotophos Bidrin (8)	6.0-8.0 ounces	0.33-0.5	24.0-16.0	
oxamyl Vydate (3.77)	17.0 ounces	0.5	7.5	

Table 11. Cotton aphid

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold / Remarks
flonicamid Carbine (50)	1.4-2.8 ounces	0.044-0.089	11.4-5.7	• Treat when honeydew, leaf crinkling, and stunting begin to occur uniformly.
sulfoxaflor Transform (50)	0.75-1.0 ounce	0.023-0.031	21.3-16.0	
acetamiprid Strafer Max (70)	1.1 ounce	0.05	14.5	
afidopyropen Sefina (0.42)	3.0 ounces	0.01	42.7	
pyrifluquinazon PQZ (1.87)	2.4-3.2 ounces	0.035-0.047	53.3-40	

Table 12. Fall armyworms

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold/Remarks
novaluron Diamond (0.83)	6.0-12.0 ounces	0.039-0.077	21.3-10.6	• Treat when egg masses or small larvae appear. • Premix insecticides are available for this pest. See premix table.
methoxyfenozide Intrepid (2)	6.0-10.0 ounces	0.09-0.16	21.0-12.5	
spinosad Blackhawk (0.36)	2.4-3.2 ounces	0.054-0.072	6.7-5.0	
chlorantraniliprole Vantacor (5)	1.2-2.5 ounces	0.047-0.098	106.7-51.2	
bifenthrin, chlorantraniliprole Elevest	5.6-9.6 ounces	premix	22.8-13.3	

Table 13. Green stink bugs

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold/Remarks
acephate Orthene (90)	0.8 pound	0.72	1.25	• Treat stink bugs when 1 adult/nymph is found per 6 row feet, 5% adults/nymphs are found in sweep nets, or 15% to 20% of 12- to 16-day old bolls have internal injury. • Stink bug populations normally are very clumped in fields; thus, numerous samples may be required to assess infestation. • Premix insecticides are available for this pest. See premix table.
beta-cyfluthrin Baythroid XL (1)	1.6-2.6 ounces	0.0125-0.02	80.0-50.0	
dicrotophos Bidrin (8)	4.0-8.0 ounce	0.25-0.5	32.0-16.0	
bifenthrin Brigade (2)	2.6-6.4 ounces	0.04-0.1	50.0-20.0	
cyfluthrin Tombstone (2)	1.6-2.6 ounces	0.025-0.041	80.0-50.0	
lambda-cyhalothrin Karate Z (2.08)	1.6-2.56 ounces	0.025-0.04	80.0-50.0	
z-cypermethrin Mustang Max (0.8)	2.6-3.6 ounces	0.017-0.022	47.0-36.0	
a-cypermethrin Fastac (0.83)	2.6-3.6 ounces	0.017-0.023	49.0-36.0	
gamma-cyhalothrin Declare (1.25)	1.28-2.05 ounces	0.0125-0.02	100.0-62.5	
acephate Orthene (97)	0.75 pound	0.72	1.29	
oxamyl Vydate (3.77)	11.2-17.0 ounces	0.33-0.5	11.4-7.5	

Table 14. Loopers

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold/Remarks
methoxyfenozide Intrepid (2)	6.0-10.0 ounces	0.09-0.16	21.0-12.5	• Before cutout, treat when loopers cause 30% defoliation. After cutout treat at 45% defoliation. • Premix insecticides are available for this pest. See premix table.
indoxacarb Steward (1.25)	9.2 ounces	0.09	14	
spinosad Blackhawk (0.36)	2.4-3.2 ounces	0.054-0.072	6.7-5.0	
chlorantraniliprole Vantacor (5)	1.7-2.5 ounces	0.066-0.098	75.3-51.2	
bifenthrin, chlorantraniliprole Elevest	5.6-9.6 ounces	premix	22.8-13.3	

Table 15. Plant bug (tarnished, clouded)

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold/Remarks
acephate Orthene (90)	0.55-1.1 pound	0.5-1.0	1.8-0.9	• After first flower, treat at 2-3 tarnished plant bugs per 5 feet black drop cloth, 10 tarnished plant bugs per 100 sweep net samples, or 10% dirty squares. • NOTE: Diamond will not control adults. For adult control, tank-mix with an adulticide. Repeat applications at 7- to 14-day intervals as needed to maintain control. • Multiply clouded plant bug number by 1.5 when determining densities for treatment decision. • Premix insecticides are available for this pest. See premix table.
acephate Orthene (97)	0.8-1.0 pound	0.75-0.97	1.3-1.0	
dicrotophos Bidrin (8)	6.0-8.0 ounces	0.33–0.5	24.0-16.0	
novaluron Diamond (0.83)	6.0-12.0 ounces	0.039–0.078	21.3-10.67	
sulfoxaflor Transform (50)	1.5-2.25 ounces	0.047-0.071	10.7-7.1	
oxamyl Vydate (3.77)	11.2-17.0 ounces	0.33-0.5	11.4-7.5	
thiamethoxam Centric (40)	2.5-3.0 ounces	0.0625-0.075	6.4-5.3	
flonicamid Carbine (50)	2.8 ounces	0.089	5.7	
malathion Fyfanon (ULV)9.9C	16.0 ounces	1.25	8	

Table 16. Spider Mites

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold / Remarks
abamectin Agri-mek (0.15)	8.0-16.0 ounces	0.009-0.0187	16.0-8.0	• Treat when mite infestations cause areas where plants have discolored leaves. Anticipate repeating applications in five days. • Use Abamectin With Caution: Abamectin resistance in two-spotted spider mites has been detected in Louisiana. • Premix insecticides are available for this pest. See premix table.
propargite Comite II (6.0)	24.0-36.0 ounces	1.1-1.7	5.3-3.5	
dicofol Dicofol (4)	1.0 quart	1	4	
fenpyroximate Portal (0.4)	16.0-32.0 ounces	0.05-0.10	8.0-4.0	
spiromesifen Oberon (4)	4.0-8.0 ounces	0.0625-0.125	32.0-16.0	
etoxazole Zeal (72)	0.66-1.0 ounces	0.03–0.045	28.0-16.0	
abamectin Agri-Mek (0.7)	1.75-3.5 ounces	0.009-0.019	73.1-36.6	
hexythiazox Onager (1)	16.0-20.0 ounces	0.125-0.156	8.0-6.4	

Table 17. Whitefly

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Treatment Threshold / Remarks
acephate Orthene (90)	0.83-1.0 pound	0.75-0.9	1.2-1.0	Apply when 50% of plant terminals have clustering whiteflies. Control may require 3-4 applications at 5-day intervals.
thiamethoxam Centric (40)	2.0 ounces	0.05	8	
acetamiprid Strafer Max (70)	1.7-2.3 ounces	0.075-0.1	9.4-7.0	
acephate Orthene (97)	0.8-1.0 pound	0.75-0.97	1.3-1.0	
spiromesifen Oberon (4)	4.0-8.0 ounces	.0625-0.125	32.0-16.0	

Cotton – Premix Insecticide Products

The following products are available as premixes of two or more insecticides.

Trade Name (Insecticides)	Amount of Concentrate per Acre	Acres Treated per Gallon or Pound SP	Primary Target Pests (See label for other pests that may be controlled)
Athena (bifenthrin, abamectin)	10.0-17.0 ounces	12.8-7.5	Spider mites
Besiege (chlorantraniliprole, lambda-cyhalothrin)	6.5-12.5 ounces	19.7-10.2	Most caterpillar pests, stink bugs
Bidrin XP II (dicrotophos, bifenthrin)	8.0-12.8 ounces	16.0-10.0	Stink bugs, plant bugs
Brigadier (imidacloprid, bifenthrin)	5.1-7.7 ounces	25.0-16.6	Stink bugs, plant bugs
Elevest (chlorantraniliprole, bifenthrin)	4.8-9.6 ounces	26.7-13.3	Most caterpillar pests, stink bugs
Endigo ZC (thiamethoxam, lambda – cyhalothrin)	3.5-5.5 ounces	36.6-25.6	Stink bugs, plant bugs
Fyfanon Plus ULV (malathion, gamma – cyhalothrin)	8.0-16.0 ounces	16.0-8.0	Stink bugs, plant bugs
Gladiator (zeta – cypermethrin, avermectin B1)	13.0-19.0 ounces	9.8-6.7	Stink bugs, spider mites
Hero (zeta – cypermethrin, bifenthrin)	5.2-10.3 ounces	24.6-12.4	Stink bugs
Intrepid Edge (methoxyfenozide, spinetoram)	3.0-6.0 ounces	42.6-21.3	Thrips
Leverage 360 (imidacloprid, beta – cyfluthrin)	3.2 ounces	40	Stink bugs, plant bugs
Triple Crown (imidacloprid, zeta – cypermethrin, bifenthrin)	4.5-6.4 ounces	28.4-20.0	Stink bugs, plant bugs
Velum Total (fluopyram, imidacloprid)	14.0-18.0 ounces	9.1-7.1	Thrips

Corn

Table 1. Chinch bugs

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
terbufos Counter (15)G[2]	6.0-8.0 ounces per 1,000 row feet	1	See label.	**Preventive treatment** • Apply at planting. Rates are based on 1,000 feet of row. • See seed treatment Tables.
beta-cyfluthrin Baythroid XL (1)	1.6-2.8 ounces	0.013-0.02	80-45.7	**Post-emergence** • Seedling corn less than 6 inches tall: five or more bugs on 20% or more plants. • Larger plants require a judgment decision based on bug counts, crop vigor and weather conditions.
lambda-cyhalothrin Warrior II (2.08)	1.92 ounces	0.03	66.7	
bifenthrin Brigade (2)	2.1-6.4 ounces	0.033-0.1	61-20	
z-cypermethrin Mustang Max (0.8)	3.2-4.0 ounces	0.02-0.025	40-32	
cyfluthrin Tombstone (2)	1.6-2.8 ounces	0.025-0.044	80-45.7	

Table 2. Corn earworm (whorls only)

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
chlorantraniliprole, lambda-cyhalothrin Besiege	5.0-10.0 ounces	premix	25.6-12.8	• Chemical treatment for worms in the whorl is not recommended, except in extreme situations. • Plant transgenic Bt varieties recommended for your area and comply with labeled refuge requirements. • Bt corn hybrids: See Table 16.
chlorantraniliprole Vantacor (5)	1.2-2.5 ounces	0.047-0.098	106.7-51.2	
chlorantraniliprole, bifenthrin Elevest	4.8-9.6 ounces	premix	26.7-13.3	

Table 3. Cucumber beetles and grape colaspis

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
esfenvalerate Asana XL (0.66)	5.8-9.6 ounces	0.03-0.05	22-13	• At silking, treat when 5 or more bugs are found per ear.
beta-cyfluthrin Baythroid XL (1)	1.6-2.8 ounces	0.013-0.022	80-45.7	
bifenthrin Brigade (2)	2.1-6.4 ounces	0.033-0.10	61-20	
cyfluthrin Tombstone (2)	1.6-2.8 ounces	0.025-0.044	80-45.7	
lambda-cyhalothrin Warrior II (2.08)	1.28-1.92 ounces	0.02-0.03	100-66.7	
z-cypermethrin Mustang Max (0.8)	2.72-4.0 ounces	0.017-0.025	47-32	

Table 4. Cutworms

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
tefluthrin Force (3)G	3.0-4.0 ounces per 1,000 row feet	0.1	See label.	**Preventive treatment** • Apply at planting. Rates are based on 1,000 feet of row.
bifenthrin Capture LFR (1.5)	0.2-0.39 ounces per 1,000 row feet	0.04-0.08	See label.	
lambda-cyhalothrin Ballista LFC (2.5)	0.66 ounce per 1,000 row feet	0.005	See label.	
chlorethoxyfos, bifenthrin SmartChoice (5)G	4.5-5.0 ounces per 1,000 row feet	0.2-0.25	See label.	

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
lambda-cyhalothrin Warrior II (2.08)	0.96-1.60 ounces	0.015-0.025	133.3-80	**At planting bands or postemergence1** • Treat when seedling plants show 6% to 8% damage from above-ground cutting or 2% to 4% from below-ground boring. • Plant transgenic Bt varieties recommended for your area and comply with labeled refuge requirements. • Bt corn hybrids: See Table 16.
z-cypermethrin Mustang Maxx (0.8)	1.28-2.8 ounces	0.008-0.0175	100-45.7	
bifenthrin Brigade (2)	2.1-6.4 ounces	0.033-1.0	61-20	
esfenvalerate Asana XL (0.66)	5.8-9.6 ounces	0.03-0.05	22-13	
beta-cyfluthrin Baythroid XL (1)	0.8-1.6 ounces	0.007-0.013	160-80	
cyfluthrin Tombstone (2)	0.8-1.6 ounces	0.013-0.025	160-80	
bifenthrin Capture LFR (1.5)	3.4-6.8 ounces	0.04-0.08	37.6-18.8	

Table 5. Fall armyworm (whorls only)

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
chlorantraniliprole, lambda-cyhalothrin Besiege	6.0-10.0 ounces	premix	21.3-12.8	• Chemical treatment for worms in the whorl is rarely needed, except in extreme situations. Treatment for worms in the ear is not recommended. • Plant transgenic Bt varieties recommended for your area and comply with labeled refuge requirements. • Bt corn hybrids: See Table 16.
chlorantraniliprole Vantacor (5)	1.2-2.5 ounces	0.047-0.098	106.7-51.2	
chlorantraniliprole, bifenthrin Elevest	4.8-9.6 ounces	premix	26.7-13.3	

Table 6. Rootworms

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
bifenthrin Brigade (2)	0.30 ounce per 1,000 row feet	0.06-0.08		• See seed treatments Tables. • Preventive treatment. Apply at planting. Rates are based on 1,000 row feet.
terbufos Counter (15)G[2]	6.0-8.0 ounces per 1,000 row feet	1		
tefluthrin Force (3)G	4.0-5.0 ounces per 1,000 row feet	0.1		
tebupirimphos, cyfluthrin Aztec (2.1)G	6.7 ounces per 1,000 row feet	0.11		
lambda-cyhalothrin Ballista LFC (2.5)	0.66 ounces per 1,000 row feet	0.005		
chlorethoxyfos, bifenthrin SmartChoice (5)G	4.5-5.0 ounces per 1,000 row feet	0.2-0.25		

Table 7. Spider mites

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
etoxazole Zeal (72)	1.0-3.0 ounces	0.045-0.135	16-5.3	• Treat when spider mite populations are rapidly growing to prevent damage to leaves at ear height or higher.
fenpyroximate Portal (0.4)	24.0-32.0 ounces	0.075-0.01	5.3-4	
propargite Comite II (6)	36-54 ounces	1.69-2.53	3.5-2.4	
spiromesifen Oberon (4)	2.85-8.0 ounces	0.09-0.25	44.9-16	
hexythiazox Onager (1)	10.0-24.0 ounces	0.078-0.187	12.8-5.3	

Table 8. Stalk borers

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
z-cypermethrin Mustang Maxx (0.8)	2.72-4.0 ounces	0.017-0.025	47-32	• Before tassel stage, treat for 5% infested plants. • At and after tassel stage, treat for 10% infested plants. • Plant transgenic Bt varieties recommended for your area and comply with labeled refuge requirements. • Bt corn hybrids: See Table 16.
beta-cyfluthrin Baythroid XL (1)	1.6-2.8 ounces	0.012-0.022	80-45.7	
esfenvalerate Asana XL (0.66)	5.8-9.6 ounces	0.03-0.05	22-13	
cyfluthrin Tombstone (2)	1.6-2.8 ounces	0.025-0.044	80-45.7	
lambda-cyhalothrin Warrior II (2.08)	1.28-1.92 ounces	0.02-0.03	100-66.7	
methoxyfenozide Intrepid (2)	4-16 ounces	0.06-0.25	32-8	
bifenthrin Brigade (2)	2.1-6.4 ounces	0.033-0.10	61-20	
chlorantraniliprole, lambda-cyhalothrin Besiege	6.0-10.0 ounces	premix	21.3-12.8	
chlorantraniliprole Vantacor (5)	1.2-2.5 ounces	0.047-0.098	106.7-51.2	
chlorantraniliprole, bifenthrin Elevest	4.8-9.6 ounces	premix	26.7-13.3	

Table 9. Stink bugs

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
beta-cyfluthrin Baythroid XL (1)	1.6-2.8 ounces	0.012-0.022	80-45.7	• Treat if 5% of plants have bugs at or prior to ear shoot appearance. • Early season plants up to V5, treat when 10% of plants are infested.
z-cypermethrin Mustang Maxx (0.8)	2.72-4.0 ounces	0.017-0.025	47-32	
bifenthrin Brigade (2)	2.1-6.4 ounces	0.033-0.1	61-20	
cyfluthrin[4] Tombstone (2)	1.6-2.8 ounces	0.025-0.044	80-45.7	
lambda-cyhalothrin Warrior II (2.08)	1.28-1.92 ounces	0.02-0.03	100-66.7	

Table 10. Sugarcane beetle

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat

bifenthrin Brigade (2)	0.30 ounces per 1,000 row feet	0.06-0.08	See label.	• At planting[1] See seed treatment Tables.
				• Preventive treatments. Rates are based on 1,000 row feet.
				• Poncho 250, 500 and Cruiser 250, 500 and 1250 benefit from the addition of an in-furrow insecticide.
				  • Counter 15G[2]
				  • Force 3G
				  • Aztec 2.1G
				  • SmartChoice 5G[3]
				  • Bifenthrin (2)
				  • Ballista LFC (2.5)
				  • Capture LFR (1.5)

[1] Refer to the label for application instructions/restrictions on application method (i.e., in-furrow, surface band, T-band, etc.)
[2] Serious crop injury may occur if an ALS-inhibiting herbicide is applied to corn previously treated at planting with Counter 15G or other systemic organophosphate soil insecticide. Read the ALS herbicide label carefully for exact restrictions and precautions.
[3] Crop injury may occur if an ALS-inhibiting herbicide is applied too soon either before or after the application of a foliar organophosphate insecticide. Read the ALS herbicide label carefully for exact restrictions and precautions.

Insecticide Precautions and Limitations (Refer to insecticide label for complete information)

Abbreviations: REI: Re-entry interval. AI: Active ingredient.

- **Asana XL:** Toxic to fish. Do not apply directly to water. Maximum active ingredient per acre per season: 0.25 lb. Preharvest interval: 21 days. REI: 12 hours.
- **Aztec:** Toxic to fish and wildlife. Do not apply directly to water or areas where surface water is present. Maximum active ingredient per acre per season: 0.15 lb. REI: 48 hours (0 hours if the product is soil-injected or soil-incorporated and contact with anything treated is prevented).
- **Baythroid:** Toxic to fish and aquatic invertebrates. Maximum active ingredient per acre per season: 0.088 lb. Preharvest interval: 21 days. REI: 12 hours.
- **Bifenthrin:** Same as Brigade.
- **Brigade:** Do not apply within 30 days of harvest. Do not graze or cut for feed within 30 days of last application. Toxic to bees, fish, and aquatic invertebrates. Maximum active ingredient per acre per season: 0.3 lb. REI: 24 hours.
- **Counter:** Toxic to birds, fish, and other wildlife. Keep out of any body of water. REI: 48 hours.
- **Cruiser:** Toxic to wildlife and aquatic invertebrates. Do not apply directly to water and do not allow drift or runoff. REI: 12 hours.
- **Cyfluthrin:** Same as Baythroid, but maximum active ingredient per acre per season: 0.175 lb.
- **Declare:** Same as Karate, but do not apply more than 0.06 lb active ingredient per acre per season.
- **Dimethoate:** Toxic to wildlife and aquatic organisms. Do not apply after heading. Avoid runoff when spraying. REI: 48 hours.
- **Force:** Highly toxic to fish and other aquatic organisms. Do not apply directly to water or wetlands or within 20 yards of water. Rotate only to corn or soybeans. REI: 0 hours.
- **Gaucho 600:** Highly toxic to birds and aquatic invertebrates. Do not graze or feed livestock on treated seed areas for 45 days after planting. REI: 12 hours.
- **Intrepid:** Drift and runoff may be toxic to sensitive aquatic vertebrates. Do not apply by air within 150 feet or by ground within 25 feet of surface water. Do not apply within 21 days of harvest. REI: 4 hours.
- **Warrior II** Toxic to fish, aquatic organisms, and bees. Do not graze livestock on treated areas or harvest for livestock feed. Maximum active ingredient per acre per season: 0.12 lb. Preharvest interval: 21 days. REI: 24 hours.
- **Lannate:** Toxic to fish, birds, bees, and other wildlife. Keep out of any body of water. Do not graze or feed to livestock within 14 days of last application. Do not harvest grain within 14 days of last application. Maximum active ingredient per acre per season: 0.9 lb. REI: 48 hours.
- **Mustang Maxx:** Toxic to bees, fish, and aquatic vertebrates. Maximum active ingredient per acre per season: 0.10 lb. Preharvest interval: 30 days. REI: 12 hours.
- **Poncho:** Do not use treated seed for feed, food, or oil. Refer to the label for replant restrictions following treated seed planting. Treated seeds exposed to soil surface may be hazardous to wildlife.
- **Respect:** Toxic to bees, fish, and aquatic vertebrates. Maximum active ingredient per acre per season: 0.10 lb. Preharvest interval: 30 days. REI: 12 hours.
- **Tracer:** Toxic to bees. Do not apply to water. Do not apply more than 14.4 ounces per acre per year. Preharvest treatment for grain or fodder: seven days; for forage: 14 days. REI: 4 hours.

Corn seed treatments and their relative efficacy for control of seedling insect pests in field corn

(updated November 2023)

Table 11. Active Ingredient: Clothianidin

Insecticide	Rate	Corn billbug (Relative Efficacy for Insect Control[1])	White grubs (Relative Efficacy for Insect Control[1])	Wireworms (Relative Efficacy for Insect Control[1])	Seedcorn maggot (Relative Efficacy for Insect Control[1])	Cutworms[2] (Relative Efficacy for Insect Control[1])	Sugarcane beetle (Relative Efficacy for Insect Control[1])	Southern green stink bug (Relative Efficacy for Insect Control[1])	Brown stink bug (Relative Efficacy for Insect Control[1])	Chinch bug (Relative Efficacy for Insect Control[1])	Southern corn rootworm[2] (Relative Efficacy for Insect Control[1])	Western corn rootworm (Relative Efficacy for Insect Control[1])	Lesser cornstalk borer (Relative Efficacy for Insect Control[1])
PONCHO 250, NIPSIT INSIDE or ACCELERON[3]	0.25 mg a.i./kernel	NL	F	G	G	P	P	F	NL	G	E	NL	G, NL
PONCHO 500, NIPSIT INSIDE or ACCELERON with PONCHO VOTiVO 500[4]	0.50 mg a.i./kernel	F	E	G	E	P	F	G	NL	G-E	E	P, NL	G, NL
PONCHO 1250, NIPSIT INSIDEACCELERON with PONCHO VOTiVO 1250, or PONCHO VOTiVO[4]	1.25 mg a.i./kernel	G	E	E	E	F	G	G	G, NL	E	E	F-G	E, NL

Table 12. Active Ingredient: Thiamethoxam

Insecticide	Rate	Corn billbug (Relative Efficacy for Insect Control[1])	White grubs (Relative Efficacy for Insect Control[1])	Wireworms (Relative Efficacy for Insect Control[1])	Seedcorn maggot (Relative Efficacy for Insect Control[1])	Cutworms[2] (Relative Efficacy for Insect Control[1])	Sugarcane beetle (Relative Efficacy for Insect Control[1])	Southern green stink bug (Relative Efficacy for Insect Control[1])	Brown stink bug (Relative Efficacy for Insect Control[1])	Chinch bug (Relative Efficacy for Insect Control[1])	Southern corn rootworm[2] (Relative Efficacy for Insect Control[1])	Western corn rootworm (Relative Efficacy for Insect Control[1])	Lesser cornstalk borer (Relative Efficacy for Insect Control[1])
CRUISER MAXX 250[3]	0.25 mg a.i./kernel	NL	F	G	E	P	P	P	NL	F	G-E, NL	NL	G, NL

Insecticide	Rate	Corn billbug (Relative Efficacy for Insect Control[1])	White grubs (Relative Efficacy for Insect Control[1])	Wireworms (Relative Efficacy for Insect Control[1])	Seedcorn maggot (Relative Efficacy for Insect Control[1])	Cutworms[2] (Relative Efficacy for Insect Control[1])	Sugarcane beetle (Relative Efficacy for Insect Control[1])	Southern green stink bug (Relative Efficacy for Insect Control[1])	Brown stink bug (Relative Efficacy for Insect Control[1])	Chinch bug (Relative Efficacy for Insect Control[1])	Southern corn rootworm[2] (Relative Efficacy for Insect Control[1])	Western corn rootworm (Relative Efficacy for Insect Control[1])	Lesser cornstalk borer (Relative Efficacy for Insect Control[1])
PPST 250[6]	0.25 mg a.i./kernel	NL, F	F	G	E	P	P	P	NL	F	G-E, NL	NL	G, NL
CRUISER MAXX 500[3] or AVICTA COMPLETE CORN[4]	0.50 mg a.i./kernel	NL	G	G	E	P	P	F	NL	F	E	NL	G, NL
CRUISER MAXX 1250[3]	1.25 mg a.i./kernel	G	E	E	E	F	P	G	NL	G	E	P	E, NL

Table 13. Active Ingredient: Thiamethoxam + Chlorantranilirprole

Insecticide	Rate	Corn billbug (Relative Efficacy for Insect Control[1])	White grubs (Relative Efficacy for Insect Control[1])	Wireworms (Relative Efficacy for Insect Control[1])	Seedcorn maggot (Relative Efficacy for Insect Control[1])	Cutworms[2] (Relative Efficacy for Insect Control[1])	Sugarcane beetle (Relative Efficacy for Insect Control[1])	Southern green stink bug (Relative Efficacy for Insect Control[1])	Brown stink bug (Relative Efficacy for Insect Control[1])	Chinch bug (Relative Efficacy for Insect Control[1])	Southern corn rootworm[2] (Relative Efficacy for Insect Control[1])	Western corn rootworm (Relative Efficacy for Insect Control[1])	Lesser cornstalk borer (Relative Efficacy for Insect Control[1])
PPST 250 PLUS LUMIVIA[3]	0.25 mg a.i.+0.25 mg a.i./kernel	E	G[7]	G[7]	E	G[7]	P	P	NL	F	G-E, NL	NL	G, NL

Table 14. Active Ingredient: Imidacloprid

Insecticide	Rate	Corn billbug (Relative Efficacy for Insect Control[1])	White grubs (Relative Efficacy for Insect Control[1])	Wireworms (Relative Efficacy for Insect Control[1])	Seedcorn maggot (Relative Efficacy for Insect Control[1])	Cutworms[2] (Relative Efficacy for Insect Control[1])	Sugarcane beetle (Relative Efficacy for Insect Control[1])	Southern green stink bug (Relative Efficacy for Insect Control[1])	Brown stink bug (Relative Efficacy for Insect Control[1])	Chinch bug (Relative Efficacy for Insect Control[1])	Southern corn rootworm[2] (Relative Efficacy for Insect Control[1])	Western corn rootworm (Relative Efficacy for Insect Control[1])	Lesser cornstalk borer (Relative Efficacy for Insect Control[1])
IMIDA E-AG 5 FST, SENATOR 600, IMIDACLOPRID 5, ATTENDANT 600, NITROSHIELD IV	0.60 mg a.i./kernel [5]	NL	G	G	E	P, NL	P, NL	P, NL	NL	F	G, NL	NL	NL
LATITUDE[5]	3.5 oz./hundred-weight	NL	F, NL	G	G	NL	NL	NL	NL	F, NL	G, NL	NL	NL
CONCUR[3]	1.5 oz./42 lb. seed	NL	F	G	G	NL	NL	NL	NL	F, NL	G, NL	NL	NL

Table 15. Active Ingredient: Permethrin

Insecticide	Rate	Corn billbug (Relative Efficacy for Insect Control[1])	White grubs (Relative Efficacy for Insect Control[1])	Wireworms (Relative Efficacy for Insect Control[1])	Seedcorn maggot (Relative Efficacy for Insect Control[1])	Cutworms[2] (Relative Efficacy for Insect Control[1])	Sugarcane beetle (Relative Efficacy for Insect Control[1])	Southern green stink bug (Relative Efficacy for Insect Control[1])	Brown stink bug (Relative Efficacy for Insect Control[1])	Chinch bug (Relative Efficacy for Insect Control[1])	Southern corn rootworm[2] (Relative Efficacy for Insect Control[1])	Western corn rootworm (Relative Efficacy for Insect Control[1])	Lesser cornstalk borer (Relative Efficacy for Insect Control[1])
KERNEL GUARD SUPREME[3] or KICKSTART VP[3]	1.5 oz./42 lb. seed	NL	F, NL	P?	F	NL	NL	NL	NL	NL	NL	NL	NL

[1]E = highly effective, G = effective, F = inconsistent results, P = not effective, based on trials in the Southeastern U.S.; L = insect is on the label for this product; NL = insect is not on the label for this product. In this case, it is best to assume that the product is ineffective against that particular pest unless there is specific knowledge to the contrary about product efficacy in the Southeast.
[2]In the Southeast, several species of cutworms overwinter as medium to large-sized larvae. They may be capable of cutting considerable numbers of seedlings before they eat a lethal dose of the insecticide. Black cutworm, the cutworm that appears on the label of most of these products, has a different life cycle in which eggs are laid in the spring, so that black cutworm larvae will be small if they have hatched out by the time the corn is planted. Southern corn rootworm larvae are a seedling pest, not a mid-season pest like western corn rootworm larvae. **Ratings are based on input from the Southern Corn Insect Working Group which meets at the Annual Meeting of the Southeastern Branch of the Entomological Society of America.**
[3]Product name as marketed includes fungicides.
[4]Product name as marketed includes fungicides and a nematicide. AVICTA COMPLETE CORN contains abamectin; PONCHO VOTiVO contains *Bacillus firmus* I-1582.
[5]Other rates for this active ingredient are available. See label.
[6]Product name as marketed includes fungicides and a biological growth promoter.
[7]Product sell sheets state that this product provides enhanced control of white grubs, wireworms, and cutworms relative to PPST 250. Therefore, efficacy ratings were increased by one level relative to PPST 250.

Table 16. Bt corn products for 2024 in the Southern U.S. (updated October 2024).

Product trade name (Abbreviation)	Bt protein(s)	Corn earworm (ear) (Relative Efficacy for Insect Control[1])	Fall armyworm (whorl) (Relative Efficacy for Insect Control[1])	Corn borers[2] (stalk) (Relative Efficacy for Insect Control[1])	Black cutworm (seedling) (Relative Efficacy for Insect Control[1])	LCB[3] (seedling) (Relative Efficacy for Insect Control[1])	Herbicide tolerance[4]	Required refuge in the South[5]	Event(s)
Agrisure 3011	Cry1Ab mCry3A	P	F-G	E	P/F	G	GT LL	50%	Bt11, MIR604, GA21
Agrisure Viptera 3110	Vip3Aa20 Cry1Ab	E	E	E	VG	G	GT LL	20%	MIR162, Bt11, GA21
Agrisure Viptera 3111	Vip3Aa20 Cry1Ab mCry3A	E	E	E	VG	G	GT LL	20%	MIR162, Bt11, MIR604, GA21
Agrisure Viptera 3220	Vip3Aa20 Cry1Ab Cry1F	E	E	E	VG	VG	GT LL	20%	MIR162, Bt11, TC 1507, GA21
Optimum Intrasect (YHR)	Cry1F Cry1Ab	P	G	E	VG	VG	LL RR2	20%	TC 1507, MON810
Optimum Intrasect XTRA (YXR)	Cry1F Cry1Ab Gpp34Ab1/Tpp35Ab1	P	G	E	VG	VG	LL RR2	20%	TC 1507, MON810, DAS-59122-7
YieldGard VT Triple (VT3)	Cry1Ab Cry3Bb1	P	F	E	P	G	RR2	50%	MON810, MON88017
Genuity VT Double PRO (GENVT2P)	Cry1A.105 Cry2Ab2	P	VG	E	P	VG	RR2	20%	MON89034, NK603
Genuity VT Triple PRO (GENVT3P)	Cry1A.105 Cry2Ab2 Cry3Bb1	P	VG	E	P	VG	RR2	20%	MON89034, MON88017
POWERCORE	Cry1A.105 Cry2Ab2 Cry1F	P	E	E	G	VG	LL RR2	20%	MON89034, TC 1507, NK603

Product trade name (Abbreviation)	Bt protein(s)	Corn earworm (ear) (Relative Efficacy for Insect Control[1])	Fall armyworm (whorl) (Relative Efficacy for Insect Control[1])	Corn borers[2] (stalk) (Relative Efficacy for Insect Control[1])	Black cutworm (seedling) (Relative Efficacy for Insect Control[1])	LCB[3] (seedling) (Relative Efficacy for Insect Control[1])	Herbicide tolerance[4]	Required refuge in the South[5]	Event(s)
SmartStax (SSX, Dow) or Genuity SmartStax (GENSS, Monsanto)	Cry1A.105 Cry2Ab2 Cry1F Cry3Bb1 Cry34Ab1/Cry35Ab1	P	E	E	G	VG	LL RR2	20%	MON89034, TC 1507, MON88017, DAS-59122-7
Trecepta	Cry1A.105 Cry2Ab2 Vip3Aa20	E	E	E	VG	VG	RR2	20%	MON89034, NK603, MIR162,

[1]E = excellent, VG = very good, G = good, F = fair, P = poor. Excellent usually means better than 95% control. Poor means less than about 30% control.
[2]Southwestern corn borer, European corn borer, sugarcane borer, and others.
[3]Lepidopteran Bt traits do not specifically list lesser cornstalk borer (LCB) as a target pest.
[4]GT = Glyphosate tolerant; LL= Liberty Link (glufosinate tolerant); RR2= Roundup Ready 2 (glyphosate tolerant).
[5]See product Insect Resistance Management (IRM) documentation from the seed companies for more details.

Grain Sorghum

Table 1. Chinch bugs

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
imidacloprid Gaucho 600	8 fluid ounces per hundredweight seed	See label.	See label.	**Seed Treatments** • Preventive. Rates are based on 1,000 row feet.
thiamethoxam Cruiser 5FS	5.1 fluid ounces per hundredweight seed	See label.	See label.	
clothianidin Nipsit Inside (5)	5.1-6.4 fluid ounces per hundredweight seed	See label.	See label.	
cyfluthrin Tombstone (2)	2.0-2.8 ounces	0.038-0.044	64-45.7	**Foliar sprays** • Treat when 2 or more adults are found on 20% seedling plants. • For larger plants, a judgment decision based on bug counts, crop vigor, and growing conditions will determine the need for treatment.
gamma-cyhalothrin Declare (1.25)	1.54 ounces	0.015	83.1	
z-cypermethrin Mustang Maxx (0.8)	3.2-4.0 ounces	0.02-0.025	40-32	
lambda-cyhalothrin Warrior II (2.08)	1.92 ounces	0.03	66.7	
beta-cyfluthrin Baythroid XL (1)	2.0-2.8 ounces	0.02	64-45.7	
a-cypermethrin Fastac (0.83)	3.2-3.9 ounces	0.02-0.025	40-32.8	

Table 2. Corn earworm, fall armyworm (whorl feeders)

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
spinosad Blackhawk (0.36)	1.7-3.3 ounces	0.038-0.075	9.4-4.8	• Treatment in the whorl stage is rarely needed. • Treat seed heads for 1 or more worms per head until the hard dough stage. • **Use pyrethroids with caution:** Pyrethroid resistance is prevalent in corn earworms in Louisiana. • Heligen is only effective on corn earworm.
chlorantraniliprole Vantacor (5)	1.2-2.5 ounces	0.047-0.098	106.7-51.2	
lambda-cyhalothrin, chlorantraniliprole Besiege	6.0-10.0 ounces	premix	21.3-12.8	
NPV Heligen	1.0-1.6	—-	128-80	

Table 3. Head Worms

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
chlorantraniliprole Vantacor (5)	1.2-2.5 ounces	0.047-0.098	106.7-51.2	• Heligen is only effective on corn earworm.
lambda-cyhalothrin, chlorantraniliprole Besiege	6.0-10.0 ounces	premix	21.3-12.8	
NPV Heligen	1.0-1.6	—-	128-80	

Table 4. Aphids except Sugarcane Aphid

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
dimethoate Dimethoate (4)	8.0-16.0 ounces	0.25-0.5	16-8	• Treatments are rarely needed for corn leaf aphids. • Infestations of greenbug are rare.

Table 5. Sugarcane aphid

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
imidacloprid Gaucho (600)	8 fluid ounces per hundredweight seed	See label.	See label.	**Seed Treatments** • Insecticide-treated grain sorghum seed may prevent sugarcane aphid colonization for up to 40 days after emergence.
thiamethoxam Cruiser (5)	5.1 fluid ounces per hundredweight seed	See label.	See label.	
clothianidin Nipsit Inside (5)	5.1-6.4 fluid ounces per hundredweight seed	See label.	See label.	
sulfoxaflor Transform (50)	0.75-1.5 ounce	0.023-0.047	16.0-10.7	**Foliar Sprays** • Treat when an average of 50 aphids per leaf is detected on 20% of leaves in a field. Edge treatments may be justified. • Pyrethroids for sorghum midge control may flare aphids. • Use of defoliants may aid in harvest efficiency.
flupyradifurone Sivanto (1.67)	4-7 ounces	0.052-0.091	18.3-32	

Table 6. Cutworms

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
esfenvalerate Asana XL (0.66)	5.8-9.6 ounces	0.03-0.05	22-13.3	• Treat before injury reduces stand below optimum plant population.
z-cypermethrin Mustang Maxx (0.8)	1.28-4.0 ounces	0.008-0.025	100-32	
beta-cyfluthrin Baythroid XL (1)	1.0-1.3 ounces	0.008-0.01	128-98.5	
cyfluthrin Tombstone (2)	1.0-1.3 ounces	0.016-0.020	128-98.5	
lambda-cyhalothrin Warrior II (2.08)	0.96-1.28 ounces	0.015-0.02	133.3-100	
gamma-cyhalothrin Declare (1.25)	0.77-1.02 ounces	0.0075-0.01	166.2-125.5	
a-cypermethrin Fastac (0.83)	1.3-3.8 ounces	0.008-0.025	98.5-33.7	

Table 7. Fire ants

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
thiamethoxam Cruiser (5)	5.1 fluid ounces per hundredweight seed	See label.	See label.	• Preventive seed treatments.
imidacloprid Gaucho (480/600)	8/6.4 fluid ounces per hundredweight seed	See label.	See label.	
clothianidin Poncho 600	5.1-6.4 fluid ounces per hundredweight seed	See label.	See label.	

Table 8. Sorghum midge

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
methomyl Lannate (2.4)	12.0-24.0 ounces	0.225-0.45	10.6-5.3	• At 25% to 30% bloom, treat for 1 or more midges per head. • Additional treatments at 5- to 7-day intervals may be needed. • Plant early and uniformly.
lambda-cyhalothrin Warrior II (2.08)	0.96-1.28 ounces	0.015-0.02	133.3-100	
cyfluthrin Tombstone (2)	1.0-1.3 ounces	0.016-0.02	128-98.5	
gamma-cyhalothrin Declare (1.25)	0.77-1.02 ounces	0.0075-0.01	166.2-125.5	
z-cypermethrin Mustang Maxx (0.8)	1.28-4.0 ounces	0.008-0.025	100-32	
esfenvalerate Asana XL (0.66)	2.9-5.8 ounces	0.015-0.030	44.1-22	
beta-cyfluthrin Baythroid XL (1)	1.0-1.3 ounces	0.008-0.01	128-98.5	
a-cypermethrin Fastac (0.83)	1.3-3.8 ounces	0.008-0.025	98.5-33.7	
lambda-cyhalothrin, chlorantraniliprole Besiege	5.0-6.0 ounces	premix	21.3-25.6	

Table 9. Sorghum webworm

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
spinosad Blackhawk (0.36)	1.7-3.3 ounces	0.038-0.074	4.8-9.4	• Treat seed heads for 4 or more worms per head until the hard dough stage.
methomyl Lannate (2.4)	24.0 ounces	0.45	5.3	
chlorantraniliprole Vantacor (5)	1.2 – 2.5 ounces	0.047-0.098	106.7 – 51.2	
lambda-cyhalothrin, chlorantraniliprole Besiege	6.0-10.0 ounces	premix	21.3-12.8	

Table 10. Stalk borers

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Economic Threshold/When to Treat
a-cypermethrin Fastac (0.83)	1.8-3.8 ounces	0.012-0.025	71.1-33.7	• Treat before larvae bore into the stalk.
cyfluthrin Tombstone (2)	1.3-2.8 ounces	0.02- 0.044	98.5-45.7	
lambda-cyhalothrin Warrior II (2.08)	1.28-1.92 ounces	0.02- 0.03	100-66.7	
gamma-cyhalothrin Declare (1.25)	1.02-1.54 ounces	0.01- 0.015	125.5-83.1	
beta-cyfluthrin Baythroid XL (1)	1.3-2.8 ounces	0.01- 0.022	98.5-45.7	
z-cypermethrin Mustang Max (0.8)	1.76-4.0 ounces	0.011-0.025	72.7-32	
chlorantraniliprole Vantacor (5)	1.2-2.5 ounces	0.047-0.098	106.7-51.2	
lambda-cyhalothrin, chlorantraniliprole Besiege	6.0-10.0 ounces	premix	21.3-12.8	

Grain Sorghum

Insecticide Precautions and Limitations (Refer to insecticide label for complete information.)

- **Asana XL:** Toxic to fish. Do not apply directly to water. Maximum active ingredient per acre per season: 0.15 lb. Preharvest interval: 21 days. REI: 12 hours.
- **Baythroid:** Toxic to fish and aquatic invertebrates. Maximum active ingredient per acre per season: 0.066 lb. Preharvest interval: 14 days. REI: 12 hours.
- **Besiege:** Toxic to fish, and aquatic organisms and toxic to wildlife. Maximum active ingredient per acre per season: 0.06 lb lambda-cyhalothrin or 0.2 lb chlorantraniliprole. Preharvest interval: 30 days. REI: 24 hours.
- **Blackhawk:** Toxic to bees. Toxic to aquatic invertebrates, do not apply directly to water. Maximum active ingredient per acre per season: 0.28 lb. Preharvest interval for grain and straw: 21 days; for forage, fodder, and hay: 3 days. REI: 4 hours.
- **Brigade:** Do not apply within 30 days of harvest. Do not graze or cut for feed within 30 days of last application. Toxic to bees, fish, and aquatic invertebrates. Maximum active ingredient per acre per season: 0.3 lb. REI: 24 hours.
- **Cruiser:** Toxic to wildlife and aquatic invertebrates. Do not apply directly to water and do not allow drift or runoff. REI: 12 hours.
- **Cyfluthrin:** Same as Baythroid, but maximum active ingredient per acre per season: 0.131 lb.
- **Declare:** Same as Karate, but maximum active ingredient per acre per season: 0.04 lb.
- **Dimethoate:** Toxic to wildlife and aquatic organisms. Do not apply after heading. Avoid runoff when spraying. Do not feed or graze within 28 days of the last application. Maximum active ingredient per acre per season: 1 lb. REI: 48 hours.
- **Gaucho 600:** Highly toxic to birds and aquatic invertebrates. Do not graze or feed livestock on treated seed areas for 45 days after planting. REI: 12 hours.
- **Warrior II:** Toxic to fish, aquatic organisms, and bees. Do not graze livestock on treated areas or harvest for livestock feed. Maximum active ingredient per acre per season: 0.08 lb. Preharvest interval: 30 days. REI: 24 hours.
- **Lannate:** Toxic to fish, birds, bees, and other wildlife. Keep out of any body of water. Do not graze or feed to livestock within 14 days of last application. Do not harvest for grain within 14 days of last application. Maximum active ingredient per acre per season: 0.9 lb. REI: 48 hours.
- **Mustang Maxx:** Toxic to bees, fish, and aquatic vertebrates. Maximum active ingredient per acre per season: 0.125 lb. Preharvest interval: 14 days. REI: 12 hours.
- **Poncho:** Do not use treated seed for feed, food, or oil. Refer to the label for replant restrictions following treated seed planting. Treated seeds exposed on the soil surface may be hazardous to wildlife.
- **Vantacor:** Maximum active ingredient per acre per season: 0.2 lb. Preharvest interval: 14 days. REI: 4 hours.

Pasture and Forage Crops

Table 1. Alfalfa Weevils in Alfalfa

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
phosmet Imidan (70)	1.0-1.3 pounds	0.7-1.0	0.75-1	• Treat when 50% of growing tips have feeding signs.
β-cyfluthrin Baythroid XL (1)	1.6-2.8 ounces	0.0125-0.022	80-45.7	
z-cypermethrin Mustang Maxx(0.8)	2.24-4.0 ounces	0.014-0.025	57.1-32	
lambda-cyhalothrin Karate Z (2.08)	1.28-1.92 ounces	0.02-0.03	100-66.7	

Table 2. Aphids in clovers

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
malathion Malathion (5)	24-32 ounces	0.94-1.25	5.3-4	none

Table 3. Aphids in vetches

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
malathion Malathion (5)	16-32 ounces	0.63-1.25	8.0-4.0	none

Table 4. Aphids in sorghums

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
flupyradifurone Sivanto (1.67)	4.0-7.0 ounces	0.052-0.091	32.0-18.3	7-day PHI for forage. REI: 4 hours

Table 5. Armyworms and fall armyworms in pasture grasses and hay crops

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
carbaryl Sevin (4)	32-48 ounces	1.0-1.5	4-2.7	14-day PHI for grazing or harvest. REI: 12 hours.
spinosad Blackhawk (0.36)	1.1-2.2 ounces	0.025-0.049	14.5-7.3	3-day PHI for harvest. Zero-day PHI for grazing. REI: 4 hours.
chlorantraniliprole Vantacor (5)	1.2-2.5 ounces	0.047-0.098	106.7-51.2	0-day PHI for grazing or harvest. REI: 4 hours.
beta-cyfluthrin Baythroid XL (1)	1.6-1.9 ounces	0.013-0.015	80-67	0-day PHI for grazing or harvest. REI: 12 hours.
gamma-cyhalothrin Declare (1.25)	1.02-1.54 ounces	0.01-0.015	125.5-83.1	0-day PHI for grazing and 7 days for harvest. REI: 24 hours.
lambda-cyhalothrin Warrior II (2.08)	1.28-1.92 ounces	0.02-0.03	100-66.7	1-day PHI for grazing and 7 days for harvest. REI: 24 hours.
z-cypermethrin Mustang Maxx(0.8)	2.8-4.0 ounces	0.018-0.025	32-45.7	0-day PHI for grazing or harvest. REI: 12 hours.
tebufenozide Confirm (2)	6-8 ounces	0.09-0.125	16-21.3	0-day PHI for grazing or harvest. REI: 4 hours.
diflubenzuron Dimilin (2)	2.0 ounce	0.031	64	1-day PHI for grazing or harvest. REI: 12 hours.
methoxyfenozide Intrepid (2)	4.0-8.0 ounces	0.06-0.12	32.0-16.0	0-day PHI for grazing and 7 days for harvest. REI: 4 hours.

Table 6. Chinch bugs in pasture grasses

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
carbaryl Sevin (4)	32-48 ounces	1.0-1.5	4-2.7	

Table 7. Chinch bugs in forage sorghums

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
carbaryl Sevin (4)	32-64 ounces	1.0-2.0	4.0-2.0	

Table 8. Clover head weevils in clovers

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
bifenthrin Brigade (2)	6.4 ounces	0.1	20	• Examine seed heads. Treat when 10% to 20% seed heads are infested with larvae.

Table 9. Imported fire ants in pasture grasses

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
hydramethyl-non Amdro Pro	See label	1.0-1.5 pounds/acre or 5 Tbs. /mound	See label.	• Apply fire ant baits when soil temperature is 60 F or higher and rain is not forecast. • A reduction of approximately 50% in mound number and mound size may be obtained by dragging pastures and disrupting ant mounds 2 times per winter shortly before and/or during the time the air temperature is 32 F or lower.
carbaryl Sevin	Use as a mound drench as per label instructions.	See label.	See label.	
methoprene Extinguish	See label	1.0-1.5 pounds/acre or 3-5 Tbs./mound	See label.	
fenoxycarb Logic	Horse pastures only.	1.0-1.5 pounds/acre or 1-3 Tbs./mound	See label.	
spinosad Justice	Do not broadcast.	4-6 Tbs./mound	See label.	
pyriproxifen Esteem	See label	1.5-2.0 pounds/acre or 2-4 Tbs./mound	See label.	

Table 10. Leaf hoppers in pasture grasses and alfalfa

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
carbaryl Sevin (4)	32.0 ounces	1	4	• Close graze or harvest bermudagrass pastures at 6-inch height to reduce leafhopper/plant hopper populations.

Table 11. Plant bugs in clovers and legumes

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
malathion Malathion (5)	24.0-32.0 ounces	0.94-1.25	5.3-4	Seed crop only.

Table 12. Spittle bugs in bermudagrass

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
No chemical control is recommended. Prevent a dense mat of grass from forming by grazing or by close mowing and raking.				

Table 13. Spotted alfalfa aphids in alfalfa

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound SP	Comments
malathion Malathion (5)	24.0-32.0 ounces	0.93-1.25	5.3-4	• Avoid treating pollinating forages when bees are active.
dimethoate Dimethoate (4)	8.0-16.0 ounces	0.25-0.5	16-8	
z-cypermethrin Mustang Maxx (0.8)	2.24-4.0 ounces	0.014-0.025	57.1-32	

Pasture and Forage Crops

Insecticide Limitations (refer to insecticide label for complete information)
Most insecticides are toxic to bees. Avoid treating pollinating forages when bees are active. Abbreviations: REI: Re-entry interval. AI: Active ingredient. PHI: Pre-harvest interval.

- **Amdro Pro:** PHI: 7 days for cutting and baling hay. Maximum applications per year: Four.
- **Baythroid XL:** Extremely toxic to fish and aquatic invertebrates. Avoid drift, runoff and direct application to water. PHI: 0 day for grazing and harvest. REI: 12 hours.
- **Confirm:** PHI: 0 day for grazing or harvest. REI: 4 hours.
- **Dimethoate:** PHI: 10 days for grazing or harvest. REI: 48 hours.
- **Esteem:** PHI: 1 day.
- **Extinguish:** PHI: 0 day.
- **Imidan:** PHI: 7 days for grazing or harvest. REI: 5 days.
- **Justice:** No grazing restrictions.
- **Logic:** For use on HORSE PASTURES only.
- **Malathion:** PHI: 0 day for grazing or harvest. REI: 12 hours.
- **Mustang Maxx:** PHI: 3 days for cutting or grazing, 7 days for seed. REI: 12 hours.
- **Vantacor:** PHI: 0 day. REI: 4 hours.
- **Sevin (Alfalfa, Clovers):** PHI: 7 days for grazing or harvest. REI: 12 hours.
- **Sevin (Pastures):** PHI: 14 days for grazing or harvest in improved pasture; 0 days for rangeland (no improvements). REI: 12 hours.
- **Warrior II:** PHI: 1 day for forage, 7 days for hay. REI: 24 hours.

Rice

The rice water weevil, stem borer complex, and rice stink bug are the primary economic pests of rice in Louisiana. Armyworms, colaspis, rice leaf miner, South American rice miner, and rice seed midge, are occasional pests that can reduce yields. Aphids, grasshoppers, chinch bugs, and thrips are sporadic pests for which no controls are consistently recommended.

Emergence	3-leaf	Tillering	Panicle initiation	Heading	Grain development
Rice seed midge (water seeded)					
Colaspis	Colaspis				
South American rice Miner	South American rice miner				
	Rice leaf miner	Rice leaf miner			
Rice water weevil (after flooding)	Rice water weevil (after flooding)	Rice water weevil (after flooding)	Rice water weevil (after flooding)		
		Stem borers	Stem borers	Stem borers	
				Rice stink bug	Rice stink bug

Cultural Controls:

Early planting is critical to reducing the impacts of many pest insects including rice water weevils, stem borers, armyworms, and South American rice miner. Delaying the establishment of permanent flood can reduce yield losses from rice water weevils by allowing plants to establish a good root system before weevil larval infestations occur. Draining fields and drying out soil after flood can kill rice water weevil larvae. This method is only effective if larvae are feeding on roots and complete drying is achieved. Draining fields for weevil control is recommended only as a last resort due to increased weed pressure and loss of fertilizer. Water-seeded rice is highly susceptible to rice water weevil as well as rice seed midge. Removal or reducing the cutting height of rice stubble can decrease over-wintering stem borer populations. Early flooding can reduce the impacts of colaspis. Flooding or flushing can be used to control armyworm infestations in young rice. Reducing the water depth may help reduce rice water weevil infestations and control rice leaf miner infestations.

Rice water weevil chemical control: Insecticidal seed treatments are the most effective chemical controls for rice water weevil. Spectrum of pests controlled varies among products. Foliar applications of insecticides target adult weevils to prevent egg-laying. Scouting requires checking 10 locations every three to four days. Treat when adults are present or fresh feeding scars are observed and when conditions are favorable for egg-laying (i.e. water is present or will be present soon). Scout again beginning five to seven days after application. More than one application may be necessary. Applications made >10 days after the establishment of the permanent flood may not be effective as most larvae are already established in the roots.

Table 1. Rice water weevil (adults)

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
Warrior II[3]	Lambda-cyhalothrin	1.6-2.56 fl. oz./acre	21 days	• Product trade names and formulations are subject to change. Always be sure to follow current EPA approved labels.
Mustang Maxx[4]	Zeta-cypermethrin	3.2-4.0 fl. oz./acre	14 days	
Proaxis[5]	Gamma-cyhalothrin	3.20-5.12 fl. oz./acre	21 days	
Declare[6]	Gamma-cyhalothrin	1.28-2.05 fl. oz./acre	21 days	
Fastac EC[7]	Alpha-cypermethrin	3.2-3.8 fl. oz./acre	14 days	
Mustang EW[4]	Zeta-cypermethrin	3.4-4.3 fl. oz./acre	14 days	
Belay[8]	Clothianidin	4.5 fl. oz./acre	21 days	

Table 2. Rice water weevil seed treatments

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
Dermacor X-100 seed treatment[9]	Chlorantraniliprole	Varies by seeding rate (1.75 fl. oz./acre)	NA	• Dermacor and Fortenza treated seed may be used for dry- or water-seeding. • Cruiser and NipsIt are for drill-seeded rice only. • Multiple seed treatments can be used in combination.
Fortenza[9]	Cyantraniliprole	3.47 fl. oz./100 lb. seed		
NipsitInside[9]	Clothianidin	1.92 fl. oz./100 lb. seed		
Cruiser[9]	Thiamethoxam	7 fl. oz../100 lb. seed		

Table 3. Rice water weevil (eggs)[9]

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
Dimilin 2L[10]	Diflubenzuron	12-16 fl. oz. (drill-, dry- or water-seeded, delayed flood rice) 8 fl. oz. + 8 fl. oz. (water-seeded, pinpoint flood, or continuous flood rice)	21 days	• A flood is required. Do not apply if flooding is in progress.

Stem borer chemical control: Dermacor X-100 is the only seed treatment that is effective for stem borer control. It is recommended in regions where high populations of Mexican rice borer occur. For foliar applications, start scouting at panicle differentiation and early boot stage. Look for early signs of stem borer presence including orange-tan discoloration around the junction of the leaf sheath and the leaf blade. This is caused by the feeding of young larvae on the inside surface of the leaf sheath. Make application before larvae enter the stalk.

Table 4. Stem borers (sugarcane borer, Mexican rice borer, and rice stalk borer)

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
Warrior II[3]	Lambda-cyhalothrin	1.6-2.56 fl. oz./acre	21 days	Foliar applied insecticides may be tank mixed with fungicides if not prohibited by the label.
Declare[6]	Gamma-cyhalothrin	1.28-2.05 fl. oz./acre	21 days	
Proaxis[5]	Gamma-cyhalothrin	3.20-5.12 fl. oz./acre	21 days	
Dermacor X-100[9]	Chlorantraniliprole	1.75 fl. oz./acre	NA	

Rice stink bug chemical control: Direct reduction in rice grain yield from rice stink bug in Louisiana is rare, and losses are the result of reduced grain quality. Rice stink bug feeding reduces milling quality (head yield) and causes peck which can lead to discounted grain prices. To time insecticide applications, Scout in the morning for best results. Treat when there are 30 stink bugs per 100 sweeps during the first 2 weeks of heading. Treat when there are 100 stink bugs per 100 sweeps until 2 weeks before harvest.

Table 5. Rice stink bug

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
Warrior II[3]	Lambda-cyhalothrin	1.6-2.56 fl. oz./acre	21 days	• Chemical controls of rice stink bug are not recommended in regions where crawfish production is prevalent. • Pyrethroid resistance has been reported in some rice stink bug populations.
Mustang Maxx[4]	Zeta-cypermethrin	3.2-4.0 fl. oz./acre	21 days	
Proaxis[5]	Gamma-cyhalothrin	1.28-2.05 fl. oz./acre	21 days	
Declare[6]	Gamma-cyhalothrin	1.28-2.05 fl. oz./acre	14 days	
Fastac EC[7]	Alpha-cypermethrin	2.6-3.8 fl. oz./acre	14 days	
Sevin 80S[11]	Carbaryl	1.25-1⅞ lbs/acre	14 days	
Sevin 4F[11]	Carbaryl	1.0-1.5 quarts/acre	14 days	
Tenchu 20SG[12]	Dinotefuran	7.5-10.5 ounce/acre	7 days	
Malathion 57 EC[13]	Malathion	1.0-1.5 Pt/A	21 days	

Chemical control of sporadic pests: Many insects attack rice in Louisiana, but their status as economic pests are not well defined. Because the relationship between pest densities and yield loss have not been well established, no consistent treatment recommendations are available. However, treatment can be beneficial in cases where heavy infestation and feeding occurs. Insecticidal seed treatments can protect against early-season pests, but spectrums controlled vary among products. Consult your extension agents for assistance in making treatment decisions against the following sporadic pests of rice.

Table 6. Sporadic Pest – Armyworms

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
Warrior 11[3]	Lambda-cyhalothrin	1.6-2.56 fl. oz./acre	21 days	• Treat when there is 1 armyworm per 2 plants; better results are obtained when larvae are small. • Flooding is effective for armyworm control if plants are sufficiently developed.
Mustang Maxx[4]	Zeta-cypermethrin	3.2-4.0 fl. oz./acre	21 days	
Proaxis[5]	Gamma-cyhalothrin	1.28-2.05 fl. oz./acre	21 days	
Declare[6]	Gamma-cyhalothrin	1.28-2.05 fl. oz./acre	14 days	
Fastac EC[7]	Alpha-cypermethrin	3.2-3.8 fl. oz./acre	14 days	
Sevin 80S[11]	Carbaryl	1.25-1.88 lbs/acre	14 days	
Sevin 4F[11]	Carbaryl	1.0-1.5 quarts/acre	14 days	
Dermacor X-100 seed treatment[9]	Chlorantraniliprole	1.75 fl. oz./acre	NA	

Table 7. Sporadic Pest – Colaspis

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
NipsitInside[9]	Clothianidin	1.92 fl. oz./100 lb. seed (seed treatment)	NA	• CruiserMaxx and NipsitInside are for use in dry-seeded rice only.
CruiserMaxx[9]	Thiamethoxam	7 fl. oz./100 lb. seed (seed treatment)	NA	

Table 8. Sporadic Pest – Thrips

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
NipsitInside[9]	Clothianidin	1.92 fl. oz./100 lb. seed (seed treatment)	NA	• CruiserMaxx and NipsitInside are for use in dry-seeded rice only.
CruiserMaxx[9]	Thiamethoxam	7 fl. oz./100 lb. seed (seed treatment)	NA	

Table 9. Sporadic Pest – Chinch bugs

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
Warrior II[3]	Lambda-cyhalothrin	1.6-2.56 fl. oz./acre	21 days	• For foliar sprays: flood fields first to move chinch bugs up onto plants and increase exposure.
Mustang Maxx[4]	Zeta-cypermethrin	3.2-4.0 fl. oz./acre	21 days	
Proaxis[5]	Gamma-cyhalothrin	1.28-2.05 fl. oz./acre	21 days	
Declare[6]	Gamma-cyhalothrin	1.28-2.05 fl. oz./acre	14 days	
Fastac EC[7]	Alpha-cypermethrin	3.2-3.8 fl. oz./acre	14 days	
Sevin 80S[11]	Carbaryl	1.25-1.88 lbs/acre	14 days	
Sevin 4F[11]	Carbaryl	1.0-1.5 quarts/acre	14 days	
NipsitInside[9]	Clothianidin	1.92 fl. oz./100 lb. seed (seed treatment)	NA	• CruiserMaxx and NipsitInside are for dry-seeded rice only.
CruiserMaxx[9]	Thiamethoxam	7 fl. oz./100 lb. seed (seed treatment)	NA	

Table 10. Sporadic Pest – Grasshoppers

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
Warrior II[3]	Lambda-cyhalothrin	1.6-2.56 fl. oz./acre	21 days	• Use a higher rate if most grasshoppers are large in size.
Mustang Maxx[4]	Zeta-cypermethrin	3.2-4.0 fl. oz./acre	21 days	
Prolex/Proaxis[5]	Gamma-cyhalothrin	1.28-2.05 fl. oz./acre	14 days	
Fastac EC[7]	Alpha-cypermethrin	3.2-3.8 fl. oz./acre	14 days	

Table 11. Sporadic Pest – Rice leaf miner

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
Malathion 57 EC[13]	Malathion	1.0-1.5 Pt/acre	21 days	• Consider treatment only if stands are being reduced to less than 15 plants/ft^2.

Table 12. Sporadic Pest – South American rice miner

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
None	• Avoid planting late, particularly in areas known to be prone to severe infestation such as coastal areas in Cameron, Jeff Davis, and Vermilion parishes. Seed treatments applied for rice water weevil may provide some suppression of rice miners.			

Table 13. Sporadic Pest – Rice seed midge

Insecticide[1]	Active Ingredient[2]	Application Rate	Pre-harvest Interval	Comments
Warrior II[3]	Lambda-cyhalothrin	1.6-2.56 fl. oz./acre	21 days	• Seed midge is only a pest of water-seeded rice. • Treatment will not recover lost stand and replanting may be needed.
Declare[6]	Gamma-cyhalothrin	3.2-4.0 fl. oz./acre	21 days	
Proaxis[5]	Gamma-cyhalothrin	1.28-2.05 fl. oz./acre	21 days	

[1] Insecticides **are not** listed in order of effectiveness and/or preference.
[2] Trade names given are subject to change and many active ingredients are available under several generic formulations.
[3] **Warrior II** Do not use treated rice fields for the aquaculture of edible fish and crustaceans. Do not release floodwater within 7 days of application. Do not apply more than 0.12 pound A.I./acre/season. Do not apply as ultra-low volume (ULV) spray. Warrior II can be safely used when propanil products are being used for weed control. Do not exceed 0.12 pound A.I./acre when Karate is used in addition to Prolex or Proaxis in a single season.
[4] **Mustang Maxx and Mustang EW:** Do not use treated rice fields for the aquaculture of edible fish and crustaceans. Do not release floodwater within 7 days of application. Do not make applications less than 7 days apart. Do not apply more than 0.10 pound A.I. (1.0 pints)/acre/season. Do not apply as ULV spray.
[6] **Declare:** Do not release floodwater within 7 days of application. Do not use treated fields for the aquaculture of edible fish and crustacean. Do not apply more than 0.06 lbs A.I./acre per season. Do not apply more than 0.04 lbs A.I./acre within 28 days of harvest or 0.02 lbs AI within 21 days of harvest.
[7] **Fastac EC:** Do not make applications less than 7 days apart. Do not release floodwater within 7 days of application. A maximum of 0.075 pound of active ingredient may be applied per year per acre. Do not use treated rice for the aquaculture of edible fish and crustacea.
[8] **Belay:** Do not apply more than 0.075 pound ai/A as a foliar per year. Do not apply Belay after a NipsitInside seed treatment. Not to be used on rice crops that contain or support crawfish or any form of aquaculture operation. Do not apply after a third tiller has initiated on rice plants.
[9] Insecticidal seed treatments must be applied to dry seed by certified seed treaters only.
[10] **Dimilin 2L:** Do not use treated rice fields for the aquaculture of edible fish and crustaceans. Use at least 5 gallons total volume per acre. Do not release floodwater within 14 days of application.
[11] **Sevin (carbaryl):** May kill shrimp, crabs and crayfish. Do not use Sevin within 15 days before or after application of propanil; up to 2 applications per crop but not more often than once every 7 days.
[12] **Tenchu**: Do not make more than two applications with a minimum of 7 days between applications. Do not apply more than 1.34 pounds total per acre per year. Do not use flood water from treated fields for irrigation or food/feed crops. Do not use if rice fields are used for fish or crustacean farming. Do not apply to rice fields during pollen shedding when bees may be present.
[13] **Malathion 57% EC:** Do not use malathion within 15 days of applying propanil. NOTE FOR AQUATIC USES (rice); Broadcast use only over intermittently flooded areas. Application may not be made around bodies of water where fish or shellfish are grown and/or harvested.

Table 14. Rice/Crawfish Rotation Fields

Insect	Comments
Armyworms	Use B.t., *Bacillus thuringiensis* (several formulations are on the market; follow label directions). Treat when there is one armyworm per two plants. Flooding is effective for armyworm control if plants are sufficiently developed.
Rice leaf miners	Miner infestations tend to be more severe in deep water.
South American rice miner	Avoid planting late, particularly in areas known to be prone to severe infestation, such as those in coastal areas in Cameron, Jeff Davis and Vermilion parishes.

Insect	Comments
Rice seed midges	Water management: Check fields for damage during first week after planting. If stands are being reduced significantly (less than 15 plants per square feet), drain and replant if necessary.
Stem Borers	Plant as early as reasonable.
Rice stink bugs	No insecticides are available which are compatible with crawfish production.
Rice water weevil	Water management: 2-3 weeks after permanent flood, sample for rice water weevil larvae. If populations are 3 medium-to-large larvae or 5 small larvae per core, drain the field and allow the field to dry 2-3 weeks. (This allows soils to dry to the point of cracking). To minimize losses from the rice water weevil, plant as early as reasonable and delay flooding as long as possible from an agronomic perspective.

Soybean

Table 1. Banded cucumber beetle[5]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
carbaryl Sevin (4)	16 oz.	0.5	8	• 4 beetles per sweep.
lambda-cyhalothrin Warrior II (2.08)	1.28-1.60 oz.	0.02-0.025	100-80	
gamma-cyhalothrin Declare (1.25)	1.02-1.28 oz.	0.01-0.0125	125.5-100	

Table 2. Bean leaf beetle[5]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
carbaryl Sevin (4)	16 oz.	0.5	8	• After pod set, 2 beetles per sweep or when 10% of pods are damaged. • Pyrethroids may provide inconsistent control. • Trap crop.[1]
esfenvalerate Asana XL (0.66)	5.8-9.6 oz.	0.03-0.05	22-13	
lambda-cyhalothrin Warrior II (2.08)	1.28-1.60 oz.	0.02-0.025	100-80	
gamma-cyhalothrin Declare (1.25)	1.02-1.28 oz.	0.01-0.0125	125.5-100	
bifenthrin Brigade (2)	2.1-6.4 oz.	0.033-0.1	61-20	
bifenthrin, z-cypermethrin Hero (1.24)	2.6-6.1 oz.	0.025-0.06	49.2-21	
acephate Orthene	12-16 oz.	0.75-1.0	1.3-1	
lambda-cyhalothrin, thiamethoxam Endigo ZC	4.0-4.5 oz.	premix	32-28.4	
imidacloprid, beta-cyfluthrin Leverage 360	2.8 oz.	premix	45.7	

Table 3. Beet armyworm[3]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
spinosad Blackhawk (0.36)	1.7-2.2 oz.	0.038-.049	9.4-7.3	• 12 worms, ½ inch or longer per row foot or 150 worms in 100 sweeps. If pod feeding occurs, treat when 10% of pods are damaged.
indoxacarb Steward (1.25)	11.3 oz.	0.11	11.3	
methoxyfenozide Intrepid (2)	6.0-8.0 oz.	0.09-0.125	21.3-16	
chlorantraniliprole Vantacor (5)	1.2-2.5 oz.	0.047-0.098	106.7-51.2	
lambda-cyhalothrin, chlorantraniliprole Besiege	10 oz.	premix	12.8	
bifenthrin, chlorantraniliprole Elevest	5.6-9.6 oz.	premix	22.8-13.3	

Table 4. Blister beetles[5]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
carbaryl Sevin (4)	25 oz.	0.8	5.1	• Spot treat infested area when defoliation becomes excessive.

Table 5. Brown stink bug

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
cyfluthrin Tombstone (2)	2.8 oz.	0.044	45.7	• After pods appear, 1 stink bug per row foot or 36 in 100 sweeps. • Treat soybeans grown for seed at 1 stink bug per 6 row feet or 6 bugs per 100 sweeps. • **Use Pyrethroids With Caution:** Pyrethroid resistance is prevalent in Brown Stink Bugs in Louisiana.
beta-cyfluthrin Baythroid XL (1)	2.8 oz.	0.022	45.7	
z-cypermethrin Mustang Maxx(0.8)	4.0 oz.	0.025	32	
acephate Orthene	12-16 oz.	0.75-1.0	1.3-1	
lambda-cyhalothrin, thiamethoxam Endigo ZC	4.0-4.5 oz.	premix	32-28.4	
bifenthrin Brigade (2)	6.4 oz.	0.1	20	
bifenthrin, z-cypermethrin Hero (1.24)	10.3 oz.	0.1	12.4	
imidacloprid, beta-cyfluthrin Leverage 360	2.8 oz.	premix	45.3	

Table 6. Corn earworm[5,8]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
spinosad Blackhawk (0.36)	1.7-2.2 oz.	0.038-.049	9.4-7.3	• After bloom, 3 worms per row foot or 38 in 100 sweeps. • **Use Pyrethroids With Caution:** Pyrethroid resistance is prevalent in corn earworms in Louisiana.[8]
esfenvalerate Asana XL (0.66)	5.8-9.6 oz.	0.03-0.05	22-13	
carbaryl Sevin (4)	24-32 oz.	0.75-1.0	5.3-4	
Npv Heligen	1.0-1.6 oz.	See label.	128-80	
Npv Hearken	1.5 oz	See label.	85.3	
acephate Orthene	12-16 oz.	0.75-1.0	1.3-1	
indoxacarb Steward (1.25)	5.6-11.3 oz.	0.055-0.011	22.8-11.3	
lambda-cyhalothrin Warrior II (2.08)	0.96-1.60 oz.	0.015-0.025	133.3-79.4	
gamma-cyhalothrin Declare (1.25)	0.77-1.28 oz.	0.0075-0.0125	166.2-100	
z-cypermethrin Mustang Maxx (0.8)	2.8-4.0 oz.	0.0175-0.025	45.7-32	
beta-cyfluthrin Baythroid XL (1)	1.6-2.8 oz.	0.013-0.022	80-45.7	
cyfluthrin Tombstone (2)	1.6-2.8 oz.	0.025-0.044	80-45.7	
bifenthrin Brigade (2)	2.1-6.4 oz.	0.033-0.1	61-20	
bifenthrin, z-cypermethrin Hero (1.14)	4.0-10.3 oz.	0.04-0.1	32-12.4	

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
lambda-cyhalothrin, chlorantraniliprole Besiege	5-8 oz.	premix	25.6-16	• After bloom, 3 worms per row foot or 38 in 100 sweeps. • **Use Pyrethroids With Caution:** Pyrethroid resistance is prevalent in corn earworms in Louisiana.[8]
chlorantraniliprole Vantacor (5)	1.2-2.5 oz.	0.047-0.098	106.7-51.2	
Methoxyfenozide, spinetoram Intrepid Edge	4.0-6.4 oz.	premix	32-20	
bifenthrin, chlorantraniliprole Elevest	5.6-9.6 oz.	premix	22.8-13.3	

Table 7. Fall armyworm (corn strain)[5]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
carbaryl Sevin (4)	16 oz.	0.5	8	• Treat when seedling beans are reduced to 6 or less plants per foot. In older beans treat when defoliation becomes excessive.[5]
methomyl Lannate (2.4)	16-24 oz.	0.3-0.45	8-5.3	
spinosad Blackhawk (0.36)	1.7-2.2 oz.	0.038-.049	9.4-7.3	
indoxacarb Steward (1.25)	7.7-11.3 oz.	0.075-0.11	16.6-11.3	
lambda-cyhalothrin, chlorantraniliprole Besiege	8-10 oz.	premix	16-12.8	
chlorantraniliprole Vantacor (5)	1.2-2.5 oz.	0.047-0.098	106.7-51.2	
bifenthrin, chlorantraniliprole Elevest	5.6-9.6 oz.	premix	22.8-13.3	

Table 8. Fall armyworm (grass strain)[5]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
carbaryl Sevin) (4)	16 oz.	0.5	8	• Treat when seedling beans are reduced to 6 or fewer plants per foot row foot. In older beans, treat when defoliation becomes excessive.[5] • Grass strain fall armyworm, unlike corn strain fall armyworm primarily originates from grass hosts.
methomyl Lannate (2.4)	6.7 oz.	0.3-0.45	8-5.3	
spinosad Blackhawk (0.36)	1.7-2.2 oz.	0.038-.049	9.4-7.3	
indoxacarb Steward (1.25)	7.7-11.3 oz.	0.075-0.11	16.6-11.3	
lambda-cyhalothrin, chlorantraniliprole Besiege	8-10 oz.	premix	16-12.8	
chlorantraniliprole Vantacor (5)	1.2-2.5 oz.	0.047-0.098	106.7-51.2	
bifenthrin, chlorantraniliprole Elevest	5.6-9.6 oz.	premix	22.8-13.3	
lambda-cyhalothrin Warrior II (2.08)	0.96-1.60 oz.	0.015-0.025	133.3-80	
gamma-cyhalothrin Declare (1.25)	0.77-1.28 oz.	0.0075-0.0125	166.2-100	
z-cypermethrin Mustang Maxx(0.8)	1.2-4.0 oz.	0.0075-0.025	106.7-32	
beta-cyfluthrin Baythroid XL (1)	0.8-1.6 oz.	0.007-0.013	160-80	
cyfluthrin Tombstone (2)	0.8-1.6 oz.	0.013-0.025	160-80	
bifenthrin, z-cypermethrin Hero (1.24)	2.6-6.1 oz.	0.025-0.06	49.2-20.9	
methoxyfenozide, spinetoram Intrepid Edge	4.0-6.4 oz.	premix	32-20	

Table 9. Grasshoppers[5]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
diflubenzuron Dimilin (2)	2.0 oz.	0.031	64	• Treat to prevent excessive stand loss or foliage loss. • **Not effective on adults**. Apply to second and third-stage nymphs only.

Table 10. Green cloverworm[3, 5]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
carbaryl Sevin (4)	8-16 oz.	0.25-0.5	16-8	• 8 worms, ½ inch or longer, per row foot or 300 worms in 100 sweeps.
spinosad Blackhawk (0.36)	1.1-2.2 oz.	0.025-.049	14.5-7.3	
methomyl Lannate (2.4)	6.7 oz.	0.125	19.1	
indoxacarb Steward (1.25)	5.6-11.3 oz.	0.055-0.11	22.9-11.3	
lambda-cyhalothrin Warrior II (2.08)	0.96-1.60 oz.	0.015-0.025	133.3-80	
gamma-cyhalothrin Declare (1.25)	0.77-1.28 oz.	0.0075-0.0125	166.2-100	
z-cypermethrin Mustang Maxx (0.8)	1.2-4.0 oz.	0.0075-0.025	106.7-32	
beta-cyfluthrin Baythroid XL (1)	0.8-1.6 oz.	0.007-0.013	160-80	
cyfluthrin Tombstone (2)	0.8-1.6 oz.	0.013-0.025	160-80	
bifenthrin, z-cypermethrin Hero (1.24)	2.6-6.1 oz.	0.025-0.06	49.2-20.9	
chlorantraniliprole Vantacor (5)	1.2-2.5 oz.	0.047-0.098	106.7-51.2	
lambda-cyhalothrin, chlorantraniliprole Besiege	5-8 oz.	premix	25.6-16	
bifenthrin, chlorantraniliprole Elevest	5.6-9.6 oz.	premix	22.8-13.3	
methoxyfenozide, spinetoram Intrepid Edge	4.0-6.4 oz.	premix	32-20	

Table 11. Kudzu bug

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
acephate Orthene	12-16 oz.	0.75-1.0	1.3-1	• 1 nymph per sweep.
bifenthrin Discipline (2)	6.4 oz.	0.1	20	
thiamethoxam, lambda-cyhalothrin Endigo ZC	4.5 oz.	premix	28.4	
gamma-cyhalothrin Declare (1.25)	1.28-1.54 oz.	0.0125-0.015	100-83.11	

Table 12. Redbanded stink bug[4]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
acephate Orthene	12-16 oz.	0.75-1.0	1.3-1	• 16 bugs in 100 sweeps. • **Caution:** 0.5 lb of acephate applied alone has provided unsatisfactory control of redbanded stinkbugs.
thiamethoxam, lambda-cyhalothrin Endigo ZC	4.5 oz.	premix	28.4	
bifenthrin Brigade (2)	6.4 oz.	0.1	20	
bifenthrin, z-cypermethrin Hero (1.24)	10.3 oz.	0.1	12.4	
imidacloprid, beta-cyfluthrin Leverage 360	2.8 oz.	premix	45.7	
clothianidin Belay (2.13)	4.0 oz.	0.067	32	

Table 13. Salt marsh caterpillar[5]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
methomyl Lannate (2.4)	24 oz.	0.45	5.3	• Spot treat when 8 worms per row foot or when seedling beans are reduced to 6 or fewer per row foot.
acephate Orthene	12.0 oz.	0.75	1.3	
methoxyfenozide Intrepid (2)	4-8 oz.	0.06-0.125	32-16	
methoxyfenozide, spinetoram Intrepid Edge	4.0-6.4 oz.	premix	32-20	

Table 14. Southern green stink bug, Green stink bug

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
cyfluthrin Tombstone (2)	1.6-2.8 oz.	0.025-0.044	80-45.7	• After pods appear, 1 stink bug per row foot or 36 in 100 sweeps. Treat soybeans grown for seed at one stink bug per 6 row feet or six bugs per 100 sweeps. • Trap crop[1,2]
z-cypermethrin Mustang Maxx (0.8)	3.2-4.0 oz.	0.02-0.025	40-32	
lambda-cyhalothrin Warrior II (2.08)	1.60-1.92 oz.	0.025-0.03	80-66.7	
gamma-cyhalothrin Declare (1.25)	1.28-1.54 oz.	0.0125-0.015	100-83.11	
beta-cyfluthrin Baythroid XL (1)	1.6-2.8 oz.	0.013-0.022	80-45.7	
acephate Orthene	12-16 oz.	0.75-1.0	1.3-1	
bifenthrin Brigade (2)	2.1-6.4 oz.	0.033-0.1	61-20	
bifenthrin, z-cypermethrin Hero (1.24)	4.0-10.3 oz.	0.04-0.1	32-12.4	
imidacloprid, beta-cyfluthrin Leverage 360	2.8 oz.	premix	45.7	
thiamethoxam, lambda-cyhalothrin Endigo ZC	4.0-4.5 oz.	premix	32-28.4	

Table 15. Soybean looper[3, 5]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
methomyl Lannate6 (2.4)	24.0 oz.	0.45	5.3	• 8 worms, ½ inch or longer, per row foot or 150 worms in 100 sweeps. • **Caution:** Resistance to Intrepid, Prevathon, and Besiege has been detected across the South.
spinosad Blackhawk (0.36)	1.7-2.2 oz.	0.038-.049	9.4-7.3	
indoxacarb Steward (1.25)	5.6-11.3 oz.	0.055-0.11	22.9-11.3	
methoxyfenozide Intrepid (2)	6.0-8.0 oz.	0.09-0.125	21.3-16	
chlorantraniliprole Vantacor (5)	1.2-2.5 oz.	0.047-0.098	106.7-51.2	
lambda-cyhalothrin, chlorantraniliprole Besiege	10 oz.	premix	12.8	
bifenthrin, chlorantraniliprole Elevest	5.6-9.6 oz.	premix	22.8-13.3	
methoxyfenozide, spinetoram Intrepid Edge	4.0-6.4 oz.	premix	32-20	

Table 16. Threecornered alfalfa hopper

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
esfenvalerate Asana XL (0.66)	5.8-9.6 oz.	0.03-0.05	22-13	• Starting at pod set, 3 nymphs per row foot or 1 adult per sweep.
lambda-cyhalothrin Warrior II (2.08)	1.60 oz.	0.025	80	
gamma-cyhalothrin Declare (1.25)	1.28 oz.	0.013	100	
cyfluthrin Tombstone (2)	1.6-2.8 oz.	0.025-0.044	80-45.7	
beta-cyfluthrin Baythroid XL (1)	1.6-2.8 oz.	0.013- 0.022	80-45.7	
z-cypermethrin Mustang Maxx (0.8)	2.8-4.0 oz.	0.017-0.025	45.7-32	
acephate (Orthene)	12-16 oz.	0.75-1.0	1.3-1	
bifenthrin, z-cypermethrin Hero (1.24)	4.0-10.3 oz.	0.04- 0.1	32-12.4	

Table 17. Velvetbean caterpillar[3, 5]

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient per Acre	Acres Treated per Gallon or Pound	When to Treat (Economic threshold)
carbaryl Sevin (4)	8-16 oz.	0.25-0.5	16-8	• 8 worms, ½ inch or longer, per row foot or 300 worms in 100 sweeps. • **Preventive–**Apply at or shortly after bloom.
spinosad Blackhawk (0.36)	1.1-2.2 oz.	0.025-.049	14.5-7.3	
lambda-cyhalothrin Warrior II (2.08)	0.96-1.28 oz.	0.015-0.02	133.3-100	
gamma-cyhalothrin Declare (1.25)	0.77-1.28 oz.	0.0075-0.015	166.2-100	
cyfluthrin Tombstone (2)	1.8 oz.	0.028	71.1	
beta-cyfluthrin Baythroid XL (1)	1.6-2.8 oz.	0.013-0.022	80-45.7	
z-cypermethrin Mustang Maxx (0.8)	2.8-4.0 oz.	0.0175-0.025	45.7-32	
methoxyfenozide Intrepid (2)	4.0-8.0 oz.	0.06-0.125	32-16	
methomyl Lannate (2.4)	6.7 oz.	0.125	19.1	
bifenthrin, z-cypermethrin Hero (1.24)	4.0-10.3 oz.	0.04-0.1	32-12.4	
diflubenzuron Dimilin (2)	2.0 oz.	0.031	64	
chlorantraniliprole Vantacor (5)	1.2-2.5 oz.	0.047-0.098	106.7-51.2	
lambda-cyhalothrin, chlorantraniliprole Besiege	5.0-8.0 oz.	premix	25.6-16	
bifenthrin, chlorantraniliprole Elevest	5.6-9.6 oz.	premix	22.8-13.3	
methoxyfenozide, spinetoram Intrepid Edge	4.0-6.4 oz.	premix	32-20	

[1] **Trap crops for control of bean leaf beetle or stinkbugs:** Where bean leaf beetle and stinkbugs occur in damaging numbers, both pests can be controlled by the use of the same early planted trap crops. Plant early maturing varieties, Group IV or V, in small blocks near favorable hibernation quarters two weeks before planting most of the crop. Areas planted to trap crops need not exceed 5% of the total acreage. Bean leaf beetles are attracted to the trap crop areas as soon as the plants emerge. The Southern green and brown stinkbug are attracted to the trap areas at the beginning of the flowering and pod set. Thus, treatment will differ for the two pests. For bean leaf beetles, foliar insecticide applications can be made to control the first field generation that develops in the trap crop. The first treatment should be made when new adults begin to emerge, about four to five weeks after planting and the second, one week later.

[2] For southern green stinkbugs, treat the trap area or soybeans grown for seed with a recommended material at one bug per 6 feet of row or six bugs in 100 sweeps and before immature bugs become adults. Start monitoring insect numbers at bloom. A second application may be necessary. For both pests, it is imperative that the insects produced in the trap areas be prevented from moving to the main plantings regardless of how many applications are required. ***The widespread adoption of early planting and early maturing varieties has made trap cropping less feasible in some areas.***
[3] Beet armyworms, green cloverworms, soybean loopers, and velvetbean caterpillars should be counted together, and an insecticide to control them should be applied when any combination of the four reaches 300 worms in 100 sweeps. However, treatment should be made anytime soybean loopers and/or beet armyworms exceed 150 worms in 100 sweeps.
[4] Effective control of the redbanded stinkbug has been difficult to achieve with labeled insecticides. Multiple applications may be required to achieve season-long control.
[5] Prior to bloom, soybeans can tolerate 30% to 35% defoliation. During bloom and pod set, defoliation should not exceed 20%-to 25%.
[6] Recent LSU AgCenter research has shown satisfactory control of soybean looper with Lannate at 0.45 pound AI per acre. In past years, however, this pest has been highly resistant to Lannate at some locations. Producers should be aware that the current use of Lannate might still give inconsistent results.
[7] LSU AgCenter Research indicates that low rates of Blackhawk will not give satisfactory control of rapid outbreaks of soybean looper that far exceed the economic threshold. Also, the ground application is more effective than the aerial application.
[8] Some corn earworms are exhibiting resistance to pyrethroids. When numbers exceed two times the action threshold, use other products or add 0.5 lb of Orthene (acephate) to the recommended pyrethroid.

CAUTION: A species of green stinkbug that feeds almost exclusively on morning glory occurs in soybean fields infested with this weed. This species is not a pest and should not be controlled. The adult can readily be recognized by a white, heart-shaped spot in the middle of the upper surface. In early September, this species turns a dark brown to deep red resembling the brown stinkbug, but it can be recognized by the white spot.

CAUTION: The lesser cornstalk borer can be a serious soil insect problem. Most problems occur in late-planted soybeans that follow wheat or ryegrass. Drought and high temperatures are also usually associated with the problem.

Soybean

Insecticide Precautions and Limitations (refer to insecticide label for complete information)
Abbreviations: REI: re-entry interval; AI: active ingredient; GPA: gallons per acre

- **Asana XL:** Extremely toxic to fish and aquatic invertebrates. Do not feed or graze livestock on treated fields. Do not exceed 0.2 lb AI per acre per season. Preharvest interval: 21 days. REI: 12 hours.
- **Baythroid XL:** Same as cyfluthrin (2) except the maximum AI per acre per season is 0.0875 lb. Preharvest interval: 21 days.
- **Brigade:** Toxic to fish and aquatic invertebrates. Do not exceed 0.3 lb AI per acre per season. Preharvest interval is 18 days. REI: 12 hours.
- **Carbaryl (Sevin):** Toxic to bees, estuarine, and aquatic organisms. Preharvest intervals: 21 days for grain, 14 days for grazing or forage. Maximum AI per acre per season is 6 lb. REI: 12 hours.
- **Cyfluthrin:** Toxic to fish and aquatic invertebrates. Maximum AI per acre per season is 0.175 lb. Do not feed forage within 15 days of harvest. Preharvest interval: 45 days. REI: 12 hours.
- **Declare:** Extremely toxic to fish and aquatic organisms and toxic to wildlife. Do not graze or harvest treated soybean for forage, straw, or hay for livestock feed. Do not apply more than 0.03 lb AI per acre per season. Preharvest interval: 30 days. REI: 24 hours.
- **Dimilin:** Toxic to aquatic invertebrates. Do not make more than two applications per season. Preharvest interval: 21 days. REI: 12 hours.
- **Endigo ZC:** Toxic to fish, aquatic organisms, and wildlife. Do not apply to water. Avoid weather conditions that favor drift and runoff. Do not exceed a total of 9 fluid oz. of Endigo, or 0.06 lb AI of lambda-cyhalothrin products, or 0.125 lb AI of thiamethoxam products per acre per season. Do not graze or harvest straw, forage, or hay for livestock. Preharvest interval: 30 days. REI: 24 hours.
- **Hero:** Toxic to fish, oysters, shrimp, and aquatic invertebrates. Do not exceed 0.4 lb AI per acre per season. Do not graze or harvest forage, straw, or hay for livestock. Preharvest interval: 21 days. Re-entry interval: 12 hours.
- **Intrepid:** Drift and runoff may be toxic to sensitive aquatic invertebrates. Do not apply by air within 150 feet or by ground within 25 feet of surface water. Apply no more than 1 lb AI per acre per season or four applications per acre per season. Preharvest interval: 14 days for seed and seven days for hay or forage. REI: Four hours.
- **Karate:** Toxic to fish, aquatic organisms, and bees. Do not graze or harvest treated forage, straw, or hay for livestock. Do not apply more than 0.06 lb AI per acre per season. Preharvest interval: 30 days. REI: 24 hours.
- **Lannate:** Toxic to fish, aquatic invertebrates, bees, and wildlife. Do not apply within 14 days of harvest. Do not apply more than 1.35 lb AI per acre per year. Do not graze forage within 3 days of last application. Preharvest interval: 12 days. REI: 48 hours.
- **Leverage 360:** Extremely toxic to fish and aquatic invertebrates. Direct sprays and residues are highly toxic to bees. Avoid drift and runoff when treating. Use of this product on highly permeable soils with a shallow water table may result in groundwater contamination. The maximum formulated product allowed per crop season: 9 fluid oz. (0.07 lb AI of beta-cyfluthrin and 0.14 lb AI of imidacloprid). Preharvest interval: 21 days for seed and 15 days for hay and green forage. REI: 12 hours.
- **Mustang Maxx:** Toxic to aquatic invertebrates, fish, oysters, and shrimp. Do not apply more than 0.15 lb AI per acre per season. Preharvest interval: 21 days. REI: 12 hours.
- **Orthene/Acephate:** Apply by air at 5-10 GPA and by ground at 10-50 GPA. Do not harvest for hay or forage. Do not apply more than 2.0 ai AI per acre per season. Preharvest interval: 14 days. REI: 24 hours.
- **Steward:** Toxic to fish, birds, and aquatic invertebrates. Do not feed or graze livestock on treated fields. Do not apply more than 0.44 lb AI per acre per year. Preharvest interval: 21 days. REI: 12 hours.
- **Blackhawk:** Toxic to bees and mollusks. Do not apply more than 0.186 lb A.I. per acre per year. Do not feed treated forage/hay to beef or dairy cattle. Preharvest interval: 28 days. REI: Four hours.

Stored Grain

Clean the storage bin

Good sanitation practices can prevent at least one early fumigation. Bins should be thoroughly cleaned at least two weeks prior to storing grain. All old grain, trash and debris should be cleaned from within and around the storage bins and fumigated or burned. Spray the bin inside and out including overhead with a labeled insecticide.

Treat the storage bin

- Centynal (Deltamethrin) – Apply 0.25-1.5 fluid ounces in 1 gallon water per 1,000 square feet.
- Diacon – D IGR ((S)-Methoprene) – Apply 1.5 ounces per 1,000 square feet.
- Diacon IGR *PLUS* ((S)-Methoprene + Deltamethrin) – 0.25-1.5 fluid ounces per 1,000 square feet.
- Tempo SC Ultra (ß- Cyfluthrin) – Apply 8-16 milliliters of concentrate per 1,000 square feet. See the label for water to add in preparing the spray solution.

Grain Protectants

Grain that is to be held in storage should be protected from stored grain insects. An approved grain protectant applied to the grain at the time of storage will help prevent an early infestation. Grain must be at the proper moisture content for storage. Do not apply before high temperature drying. High temperature and high moisture content of grain will shorten the residual life of grain protectants. See insecticide labels for specific application instructions. Most grain protectant solutions should be applied to the grain as it enters the storage bin on the conveyor belt unless it is applied as a surface treatment.

1. B.t. (*Bacillus thuringiensis*) sold as Dipel and others. Follow label directions for surface treatment only to control Indian meal moth.
2. Actellic 5E[1] (Pirimiphos-methyl): Corn and Grain Sorghum: 9.2-12.3 ounces per 5 gallons water per 1,000 bushels; as a surface treatment for Indian Meal moth 3 ounces per 2 gallons of water per 1,000 square feet. Actellic should give nine to 12 months of control of all stored grain insects in Louisiana (except lesser grain borer). **Not labeled or effective for corn stored in the shuck.**
3. Fyfanon (Malathion) 6 percent Grain Dust: Wheat, Corn, Oats – 10 pounds of dust per 1,000 bushels as grain is being loaded or turned into final storage. This insecticide may not be a suitable grain protectant because it breaks down rapidly and many stored-grain insects have developed high resistance to it in other states. National tolerance for malathion on grain is very low. Grain treated with malathion may be unmarketable in international markets. (See label for further mixing instructions)
4. Pyrenone (Pyrethrins) (6% pyrethrins and 60% PBO) – **Short-term knock-down control. Degrades rapidly.** Barley, corn, rice, sorghum, and wheat – mix 1 part Pyrenone with 29 parts water. Apply 3-5 gallons per 1,000 bushels.
5. Diatomaceous earth (several trade names). Barley, corn, oats, rice, rye, sorghum, wheat. Follow the label.
6. Dichlorvos resin strips (DDVP, Vapona). Barley, corn, oats, rye, sorghum, soybean, sunflower, wheat. One strip is needed per 1,000 cubic feet of bin headspace. Vapor is released from dichlorvos strips that kills adult Indianmeal moths preventing reproduction.
7. Centynal (Deltamethrin) –
    - Wheat 9.14 fluid ounces per 5 gallons of water per 1,000 bushels.
    - Barley 7.31 fluid ounces per 5 gallons of water per 1,000 bushels.
    - Oats 4.88 fluid ounces per 5 gallons of water per 1,000 bushels.
8. Sensat (Spinosad) –
    - Wheat 10.5 fluid ounces per 5 gallons of water per 1,000 bushels.
    - Barley 8.2 fluid ounces per 5 gallons of water per 1,000 bushels.
    - Oats 5.9 fluid ounces per 5 gallons of water per 1,000 bushels.
9. Diacon IGR *PLUS* ((S)-Methoprene + Deltamethrin) – Barley, corn, oats, popcorn, rice, rye, sorghum, wheat. Rates vary among commodities, 5.15-19.20 fluid ounces per 1,000 bushels.

Fumigation

Aluminum Phosphide (Phostoxin)–Used against rice weevils, lesser grain borer, flour beetles (bran bugs), sawtoothed grain beetle, flat grain beetle, Angoumois grain moth, and Indian meal moth. Bins must be gas-tight. Phosphine gas is deadly to people and other animals. Bin must remain closed after and during fumigation for 4 days at a minimum. Do not fumigate below 40 F. Follow all safety and application guidelines.

Sugarcane

Louisiana Recommendations for Control of Sugarcane Insects

The sugarcane borer (SCB) and the Mexican rice borer (MRB) are the most destructive insects attacking the Louisiana sugarcane crop. Soil insects, including wireworms, sugarcane beetle, and Hemipteran pests, including sugarcane aphid, yellow sugarcane aphid, and West Indian cane fly, are sporadic pests for which no controls are consistently recommended. Other insects, such as sugarcane mealybugs, root stock weevils, and mole crickets, are not considered economic pests of sugarcane in Louisiana.

Stem Borers: Sugarcane Borer and Mexican Rice Borer

Cultural practices

The following farming practices can reduce stem borer infestations and damage:

1. Plant noninfested seed cane to improve crop stands. Stem borer larvae in seed cane can contribute substantially to overwintering populations.
2. Plant corn as far as possible from sugarcane to reduce midsummer moth movement from senescing corn into sugarcane.
3. Plow out old stubble soon after the final harvest to reduce the number of overwintering larvae.
4. Leave crop residues such as cane tops and stalk pieces exposed on the soil surface throughout winter to obtain maximum kill of larvae by winter temperatures.
5. Avoid early August plantings, which are more susceptible to stem borer deadhearts and often harbor increased densities of overwintering larvae. Plant cane fields often have earlier treatable infestations.

Sugarcane borer infestations are greatest in vigorously growing cane, while Mexican rice borer infestations are exacerbated by drought conditions.

Varietal resistance

Some varieties of sugarcane withstand or avoid stem borer attack better than others. The following commercial varieties are ranked in order of their susceptibility to stem borers based on results from replicated field trials.

- Resistant–HoCP 85-845, L 01-299, HoCP 04-838 (SCB)
- Moderate–L 01-283, L 03-371, HoCP 09-804, Ho 12-615, Ho 13-739, L 14-267, Ho 15-508
- Susceptible–HoCP 96-540, HoCP 00-950, HoCP 04-838 (MRB), L 11-183, L 12-201, HoCP 14-885, L 15-306

Plant resistant varieties wherever appropriate. This can reduce the need for insecticide applications. It is also important to plant resistant varieties adjacent to schools, waterways, and other areas where aerial applications are not recommended. No variety exhibits complete resistance, and periodic scouting of resistant varieties is recommended. Plant each variety in as large an acreage block as possible. This method helps the scouting program and cuts down on the treatment of resistant varieties when mixed with susceptible varieties.

Insecticides labeled for control of stem borers. In addition to the reduced-risk insecticides listed below, several pyrethroids are labeled for stem borers but are not recommended.

Table 1. Stem borer

Insecticide	IRAC Mode of Action	Active Ingredient	Rate Fluid Ounce/Acre	PHI
Diamond 0.83 EC	Benzoylurea [IGR] (15)	Novaluron	9.0-12.0	14 days
Vantacor	Diamide (28)	Chlorantraniliprole	1.2-2.5*	14 days
Besiege	Diamide (28) + Pyrethroid (3A)	Chlorantraniliprole + lambda-cyhalothrin	8.0-10.0	21 days

*Rates >2.0 fl oz/acre are not recommended

Application timing
Insecticide applications should be made only after internodes have begun to form and when economic infestations are detected. It is important that fields be scouted at weekly intervals from June through September, and that insecticides be applied only when economically injurious borer infestations exist at an action threshold of 5% stalks infested with live larvae in leaf sheaths. Applications may be made after Sept. 15 as long as the PHI is considered, however, late season borer infestations are less likely to reduce yields than mid-summer infestations.

Application methods
Because of the limited exposure of stem borer larvae and the high biomass of sugarcane, insufficient water volume can reduce insecticide efficacy. A minimum of 5 gal/acre is recommended for aerial applications and 10 gal/acre for applications made with a ground sprayer. The use of adjuvants including spreaders and/or binders can improve coverage in late season applications when a dense canopy is present. The use of a large droplet size will reduce the risk of pesticide drift. If more than one application per season is needed, rotation of chemistries is recommended to delay the development of insecticide resistance.

West Indian Canefly
The West Indian canefly (WIC) is a sporadic pest of sugarcane that may become problematic following warm winters without hard freezes. Only pyrethroids are labeled for WIC control. Caution should be used when applying pyrethroids for WIC control, as these products may flare aphid infestations. Apply with a minimum water volume of 5 gal/acre (aerial) and 10 gal/acre (ground).

Table 2. West Indian Canefly

Insecticide	Active ingredient	Rate (Fluid Oz/Acre)	PHI
Warrior, generics	lambda-cyhalothrin	1.6-2.6	21 days
Besiege	chlorantraniliprole + lambda-cyhalothrin	8.0-10.0	21 days

Sampling
Scouting should be done by examining the underside of canopy leaves (Third or fourth down from the dewlap) and counting the number of nymphs present. Growers should make an insecticide application when populations are increasing for two consecutive weeks and average > 30 nymphs/leaf with honeydew and sooty mold in the upper canopy. The relationship between WIC infestations and yield reductions is still being investigated. WIC infestations generally decline as cane matures later in the season, and treatment after August is not recommended.

Wireworms
Soil treatment is recommended to control wireworms where sod/pastureland is planted to cane or where wireworms are known to be a problem. Wireworm damage results in reduce stands and generally occurs in patches. Wireworms are more problematic in sandy or sandy-loam soils. Apply granular insecticide over seed pieces in the open furrow in a band 12-16 inches wide so that all the seed pieces have contact. The application should be made just before the seed pieces are covered with soil. Heavy soils rarely have wireworm problems.

Table 3. Wireworms

Insecticide	Active Ingredient	Rate	Application
Thimet 20G EZ Load	Phorate	19.5 lbs./acre*	Apply in furrow around planted cane in a 12-16-inch band and cover with soil.
Mocap 20G	Ethoprop	10-20 lbs./acre	

*Lower rates may still be effective and are less detrimental to beneficial insects.

Sampling
Wireworms can be sampled by setting up one to two bait stations per 10 acres one to four weeks before planting. For each bait station, bury a handful of fermented corn seeds 2–4 inches deep (corn seeds must not be coated with a seed treatment). Cover with a small mound of soil and mark the location with a flag. Remove the soil and count the number of wireworms attracted to each bait station one week after set up. An average of greater than one wireworm per bait station should be treated.

Soil-applied insecticides may reduce populations of fire ants and lead to increased stem borer infestations.

Note
No liquid formulations are labeled for wireworms. Use of the smart-box “lock’N load” applications systems for granular insecticides is required.

Aphids: Sugarcane Aphid and Yellow Sugarcane Aphid

Aphids are sporadic sugarcane pests that have the potential to reduce yields through direct feeding and transmission of the sugarcane yellow leaf virus. **No insecticides are recommended for the control of aphids**, and insecticides are not effective at reducing virus transmission. Only pyrethroids are registered for aphid control and these products can potentially flare aphid infestations by reducing populations of beneficial insects.

Sweet Potatoes

Sweet potatoes can be damaged by soil and foliage-feeding insect species throughout the production season. In addition, sweetpotato weevils can be a problem in storage. Insect damage results in economic losses, due to yield and overall quality losses.

Root feeding Insects

Banded cucumber beetles, whitefringed beetles, and flea beetle species
Foliar applied insecticides are applied to manage the adult stages of these pests to prevent them from laying eggs in the soil. Insecticide applications should be made only when the pests are present in sufficient numbers to warrant control. The threshold for spotted and banded cucumber beetles is 2 beetles/100 sweeps. The threshold for whitefringed beetles is 1 beetle/100 sweeps. See the insecticide chart for approved insecticides. *Please read and follow all label directions.*

Wireworms, white grubs, and rootworms
These are larvae of click beetles, June bugs, and banded and spotted cucumber beetles that tunnel or chew large holes in the developing sweet potato roots. Preplant, soil-incorporated insecticides are applied to control the immature stages of these pests that are present in the soil at the time of application. These chemicals provide residual control for four to six weeks. Insecticides labeled for pre-plant application include Mocap, Brigade, Belay, and Admire Pro. Please consult the approved list of insecticides labeled for sweet potatoes in Louisiana included below. *Read and follow all label directions*.

Sugarcane beetle
Research is ongoing to identify management strategies for this insect in sweet potatoes. Damage may be increased in fields bordering pasture or field corn. The adult is the damaging stage of this insect. Damage occurs late in the production season prior to harvest. Soil applications of approved insecticides may reduce damage. Please consult the table on the next page for recommended insecticides.

Aphids, flea beetles, and whiteflies

- Apply Admire Pro to the soil and incorporate to control aphids and whiteflies (vectors of virus diseases). Rates per application range from 4.4-10.5 fl. ounces/acre.
- Use Platinum 2F (thiamethoxam) applied in-furrow at planting or as a lay-by-shanked application to control aphids, whiteflies, and flea beetles.
  Recommended rates per application range from 5-8 fl. ounces/acre. Follow mixing directions and read the label carefully.

Foliage-feeding loopers, beet armyworms, and other Lepidopteran species
When defoliation reaches 35% or higher apply approved insecticides. Please consult the below table for a list of foliar insecticides and consult the label for specific looper or armyworm species controlled.

Sweetpotato Weevils – Cultural and Chemical Control Measures

Sweetpotato weevil larvae attack the roots of the sweet potato plant, tunneling through the root as they feed. Sweet potatoes are susceptible to attack by the sweet potato weevil at any time during the growing period as well as in storage.

All cultural and sanitation practices for control of the sweetpotato weevil should be followed. This includes acquiring weevil-free seed, cutting vines or slips (rather than pulling), destroying all potatoes left in fields, controlling weevils in the seedbed, and destruction of the seedbed when plant production is finished. Also, if an infestation is bad, spray fields with approved insecticides (see insecticide chart). Pheromone traps should be placed in fields to help determine weevil population levels. If several weevils are caught per trap per night, then foliar spray applications should be made.

In the Field
Rotate field plantings. Plant the new crop as far away as possible from the previous year's plantings. Producers in the pink tag production region should follow the regulations set by the Louisiana Department of Agriculture and Forestry, regarding the mandatory spray program for sweetpotato weevils. Apply approved insecticides on a seven to 10-day spray schedule to all seedbeds and production fields to suppress sweetpotato weevil populations in the field.

At Harvest
Seed sweet potatoes should be selected at harvest from fields apparently free of sweetpotato weevil. Destroy all vines and roots left in the field. If seed potatoes appear to be heavily infested, consider purchasing weevil-free seed from a weevil-free area.

In Storage
Remove all old sweet potatoes from the storage area for at least one month before storing the new crop. Store only those potatoes that are apparently weevil-free and reasonably clean. Treat potatoes going into storage with 5% Imidan dust at 2-4 ounces per bushel using an applicator approved by the Louisiana Department of Agriculture and Forestry. **Note:** Although Imidan dust is labeled for use, it might be challenging to obtain the product.

In Seedbeds
Locate seedbeds away from sweet potato storage and last season's plantings. Weevils may enter seedbeds from outside sources. To minimize the infestation from invading weevils, apply approved insecticides at weekly intervals beginning when plants first emerge (or when the plastic cover is removed from the seedbed) and continuing as long as the seedbed is used. Almost all weevil eggs in plant stems are found near the soil surface so plants should be cut at least an inch above the soil level. Destroy the seedbed when it is no longer needed but no later than July 15 each year.

Warning
Re-entry time for workers entering treated fields should be strictly observed. Be sure to check for this information.

Sweet Potatoes

Table 1. Cucumber beetles, white grubs, whitefringed beetles, wireworms

Insecticide*	Amount Concentrate Per Acre	Pounds Active Ingredient/ Acre	Acres Treated Per Gallon/Lb	Comments
Bifenthrin**	19.2 fluid ounces	0.3	6.5	Preplant and layby, not to exceed 0.5 pounds AI/acre per year
Bifenthrin**	3.2-9.6 fluid ounces	0.05-0.15	40-13	At cultivation or layby
Mocap EC	5.1-6.9 fluid ounces per 1,000 row ft.	3.0-4.0	2-1.5	Preplant 12-15 in. band on 42 in. row
Mocap 15G	20-26 pounds	3.0-4.0	See label.	

Table 2. Sugarcane beetles, flea beetles, white grubs, wireworm suppression

Insecticide*	Amount Concentrate Per Acre	Pounds Active Ingredient/ Acre	Acres Treated Per Gallon/Lb	Comments
Belay	9-12 fluid ounces	0.15-1.21	10.0-9.0	Preplant and layby

Table 3. Aphids, whiteflies, flea beetles

Insecticide*	Amount Concentrate Per Acre	Pounds Active Ingredient/ Acre	Acres Treated Per Gallon/Lb	Comments
Admire Pro	4.4-10.5 fluid ounces	0.16-0.38	29-12	Preplant and layby

Table 4. Aphids, flea beetles

Insecticide*	Amount Concentrate Per Acre	Pounds Active Ingredient/ Acre	Acres Treated Per Gallon/Lb	Comments
Platinum 2F	5-8 fluid ounces	0.078-0.125	25-16	Preplant and layby

Table 5. Cucumber beetles, whitefringed beetles, flea beetle

Insecticide*	Amount Concentrate Per Acre	Pounds Active Ingredient/ Acre	Acres Treated Per Gallon/Lb	Comments
Bifenthrin**	2.1-6.4 fluid ounces	0.033-0.10	61-20	Foliar application
Imidan 70-W	1.3 pounds (pH 5.5)	0.91	See label.	
Sevin XLR- Plus	1-2 quarts	1.0-2.0	4.0-2.0	
Assail 30 SG	1.5-4 ounces	0.028-0.075	10.5-4	
Baythroid XL	1.6-2.8 fluid ounces	0.013-0.022	80-46	
Mustang Max	1.76-4 fluid ounces	0.011-0.025	73-32	
Leverage 360	2.4-2.8 fluid ounces	See label.	53-46	
Endigo ZC	4.0– 4.5 fluid ounces	0.036-0.041 0.027-0.03	32-28	

Table 6. Sweetpotato weevils

Insecticide*	Amount Concentrate Per Acre	Pounds Active Ingredient/ Acre	Acres Treated Per Gallon/Lb	Comments
Leverage 360	2.4-2.8 fluid ounces	See label	53-46	Foliar application
Bifenthrin**	2.1-6.4 fluid ounces	0.033-0.10	61-20	
Imidan 70-W	1.3 pounds (pH 5.5)	0.91		
Sevin XLR- Plus	1-2 quarts	2-Jan	4.0-2.0	
Baythroid XL	1.6-2.8 fluid ounces	0.013-0.022	80-46	
Imidan Dust 5%	*2-4 ounces/bushel*	See label.	See label.	Dust after harvest. At present, it's hard to obtain this product.

Table 7. Armyworms

Insecticide*	Amount Concentrate Per Acre	Pounds Active Ingredient/ Acre	Acres Treated Per Gallon/Lb	Comments
Intrepid 2F	6-10 fluid ounces	0.09-0.16	21-12.8	Foliar application
Coragen	3.5-5 fluid ounces	0.04-0.06	36-25	
Mustang Maxx	3.2-4 fluid ounces	0.02-0.025	40-32	
Besiege	6-9 fluid ounces	0.04-0.06 0.02-0.03	21-14	

Table 8. Soybean looper

Insecticide*	Amount Concentrate Per Acre	Pounds Active Ingredient/ Acre	Acres Treated Per Gallon/Lb	Comments
Besiege	6-9 fluid ounces	0.04-0.06 0.02-0.03	21-14	Foliar application
Intrepid Edge	4.5-12 fluid ounces	0.08-0.23 0.02-0.05	28.4-10.6	

Table 9. Cabbage looper

Insecticide*	Amount Concentrate Per Acre	Pounds Active Ingredient/ Acre	Acres Treated Per Gallon/Lb	Comments
Avaunt	2.5-6.0 fluid ounces	0.045-0.11	51-21	Foliar application
Mustang Max	1.76-4 fluid ounces	0.011-0.025	72-32	
Baythroid XL	1.6-2.8 fluid ounces	0.013-0.022	80-46	
Intrepid Edge	4.5-12 fluid ounces	0.08-0.23 0.02-0.05	28.4-10.6	

Table 10. Aphids

Insecticide*	Amount Concentrate Per Acre	Pounds Active Ingredient/ Acre	Acres Treated Per Gallon/Lb	Comments
Assail 30 SG	2.5-4 ounces	0.048-0.075	10.5-4	Foliar application
Leverage 360	2.4-2.8 fluid ounces	See label.	53-46	

*Note incorporation instructions and methods of application for pre-plant and layby insecticides.
*Apply preplant insecticides as close to transplant as possible in accordance with label directions.
*Please note species listed, preharvest intervals, and maximum usage per acre on all labels.
*Do not exceed 0.5 lb of active ingredient bifenthrin per acre/season.
** Bifenthrin is labeled under several trade names.

Wheat and Oats

Table 1. Other insects - Aphids (including greenbug aphid)

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient/Acre	Acres Treated per Gallon or Pound SP	Comments
malathion Malathion (5)	24 ounces	1	5.3	General guideline for greenbug treatment levels: • Plant height (inches): 3-6, 4-8, 6-16 • Number of greenbugs (per linear foot): 100-300, 200-400, 300-800
sulfoxaflor Transform (50)	0.75 ounce	0.023	21.3	
dimethoate Dimethoate (4)	8-12 ounces	0.25-0.375	16-10.7	Wheat only.
lambda-cyhalothrin Warrior II (2.08)	1.92 ounces	0.03	66.7	• Suppression • Wheat only. See labels. Treat when greenbugs cause areas with dead plants. Other aphid species may not require control.
z-cypermethrin Mustang Maxx (0.8)	3.2-4 ounces	0.02-0.025	40-32	

Table 2. Other insects - True armyworm, Fall armyworm

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient/Acre	Acres Treated per Gallon or Pound SP	Comments
lambda-cyhalothrin Warrior II (2.08)	1.28-1.92 ounces	0.02-0.03	100-66.7	• Treat when 5 or more worms per square foot are found, and foliage loss is occurring.
spinosad Blackhawk (0.36)	1.7-3.3 ounces	0.038-0.075	9.4-4.8	
z-cypermethrin Mustang Maxx (0.8)	3.2-4 ounces	0.02-0.025	40-32	Wheat only

Table 3. Other insects - Stink bugs

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient/Acre	Acres Treated per Gallon or Pound SP	Comments
z-cypermethrin Mustang Maxx (0.8)	3.2-4 ounces	0.02-0.025	40-32	Wheat only
lambda-cyhalothrin Warrior II (2.08)	1.28-1.92 ounces	0.02-0.03	100-66.7	• Treat when 10% of spikes (wheat heads) in the milk stage are infested. Treat when 25% of spikes in the soft dough stage are infested.

Hessian Fly

Host plant resistance and cultural control tactics

1. Plant resistant varieties where available. The use of resistant varieties is the key method for the management of Hessian fly. The resistant variety must have the resistant gene(s) for the Hessian fly biotype present.
2. Plant during the recommended time period. There is no “fly-free date” for Louisiana.
3. Rotate wheat ground, if possible.
4. Use conventional tillage in the spring.
5. Eliminate volunteer wheat in the summer (following harvest) and fall (prior to harvest).
6. Avoid using susceptible wheat for cover crops and wildlife plantings.

Table 7. Hessian fly

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient/Acre	Acres Treated per Gallon or Pound SP	Comments
imidacloprid Gaucho 600	1.6 fluid ounces per cwt.	See label.	See label.	• Seed treatment. • Wheat only.
imidacloprid Gaucho XT	3.4 fluid ounces + Gaucho 600 @ l fluid ounce/cwt	See label.	See label.	
thiamethoxam Cruiser 5FS	1.33 fluid ounce per cwt.	See label.	See label.	
thiamethoxam Cruiser Maxx Cereals	5 fluid ounces + Cruiser 5S @ 0.5-1 fluid ounce/cwt.	See label.	See label.	
clothianidin Nipsit INSIDE	1.79 fluid ounce per cwt	See label.	See label.	

Insecticide	Amount of Concentrate per Acre	Pounds Active Ingredient/Acre	Acres Treated per Gallon or Pound SP	Comments
lambda-cyhalothrin Warrior II (2.08)	1.92 ounce	0.03	66.7	• Foliar application. • Wheat only. • Apply when adult Hessian flies are emerging and active in the fall (2- to 4-leaf stage) or the late winter, early to mid-March). Timing of applications is difficult.

Insecticide Precautions and Limitations (refer to insecticide label for complete information)

- **Malathion:** Do not apply within seven days of harvest. REI: 12 hours.
- **Dimethoate:** Do not apply within 14 days of grazing or 35 days of harvest. REI: 48 hours.
- **Warrior II:** Do not apply within 30 days of harvest. The waiting period for grazing is seven days. Do not apply more than 0.06 lb per acre per season. REI: 24 hours.
- **Mustang Maxx:** Do not apply more than 0.125 lb AI per acre per season. The postharvest interval is 14 days. REI: 12 hours.
- **Cruiser:** Toxic to wildlife and aquatic organisms. REI: 12 hours.
- **Gaucho:** Toxic to birds and aquatic invertebrates. Do not graze livestock for 45 days. REI: 12 hours.

How to Mix Insecticides

1. **How to mix wettable powder for spraying:**
If you have 50 percent Carbaryl wettable powder and want to make 50 gallons of spray containing 0.5 percent Carbaryl, use the following formula: (water weighs 8.345 pounds/gallon)

$$\frac{Gallons\ desired\ \times weight\ of\ water\ \times desired\ concentration}{\%\ active\ ingredient\ in\ insecticide\ used} = pounds\ of\ wettable\ powder$$

$$\frac{50\text{ gallons} \times 8.345 \times 0.5}{50} = 4.17\text{ pounds}$$

4.17 pounds of the 50 percent Carbaryl will make 50 gallons of 0.5 percent Carbaryl.

2. **How to mix emulsifiable concentrate for spraying:**
If you have 50 percent Malathion emulsifiable concentrate and want to make a 2 percent spray, use the following formula:

$$\frac{\%\ insecticide}{Desired\ concentration} = \frac{50}{2} = 25$$

The correct dilution is 1 part of the Malathion to 25 parts of water.

3. **How to mix dusts:**
If you have 25 percent Malathion dust and want to make 100 pounds of dust containing 5 percent Malathion, use the following formula:

$$\frac{Desired\ concentration\ \times Desired\ Weight}{\%\ active\ ingredient\ in\ insecticide\ used} = factor$$

$$\frac{5 \times 100}{25} = 20$$

20 pounds of the Malathion dust should be added to 80 pounds diluents to make 100 pounds of 5 percent dust.

Insecticide Dilution Tables

Table 1. Amount of formulated insecticide materials to use to provide the indicated active ingredient.

Formulation	0.25 pound/ acre	0.50 pound/ acre	0.75 pound/ acre	1.0 pound/ acre	1.25 pounds/ acre	1.5 pounds/ acre	2.0 pounds/ acre
1% Dust	25.0 pounds	50.0 pounds	75.0 pounds	100.0 pounds	125.0 pounds	150.0 pounds	200.0 pounds
5% Dust	5.0 pounds	10.0 pounds	15.0 pounds	20.0 pounds	25.0 pounds	30.0 pounds	40.0 pounds
10% Dust	2.5 pounds	5.0 pounds	7.5 pounds	10.0 pounds	12.5 pounds	15.0 pounds	20.0 pounds
25% WP	1.0 pound	2.0 pounds	3.0 pounds	4.0 pounds	5.0 pounds	6.0 pounds	8.0 pounds
40% WP	2/3 pound	1.25 pounds	1 7/8 pounds	2.5 pounds	3 1/6 pounds	3.75 pounds	5.0 pounds
50% WP	0.5 pound	1.0 pound	1.5 pounds	2.0 pounds	2.5 pounds	3.0 pounds	4.0 pounds
75% WP	1/3 pound	2/3 pound	1.0 pound	1 1/3 pounds	1 2/3 pounds	2.0 pounds	2 2/3 pounds
1 pound/gal. EC	1.0 quart	2.0 quarts	3.0 quarts	4.0 quarts	5.0 quarts	6.0 quarts	8.0 quarts
1.5 pounds/gal. EC	2/3 quart	1 1/3 quarts	2.0 quarts	2 2/3 quarts	3 1/3 quarts	4.0 quarts	5 1/3 quarts
2 pounds/gal. EC	1.0 pint	1.0 quart	3.0 quarts	2.0 quarts	5.0 pints	3.0 quarts	2.0 quarts
4 pounds/gal. EC	0.5 pint	1.0 pint	1.5 pints	1.0 quart	2.5 pints	3.0 pints	2.0 quarts
6 pounds/gal. EC	1/3 pint	2/3 pint	1.0 pint	1 1/3 pints	1 2/3 pints	2.0 pints	2 2/3 pints
8 pounds/gal. EC	0.25 pint	0.5 pint	0.75 pint	1.0 pint	1.25 pints	1.5 pints	2.0 pints

EXAMPLE: You wish to apply an insecticide at the rate of 1 pound (active ingredient) per acre and you purchase an emulsifiable concentrate (EC) formulation containing 2 pounds (active ingredient) per gallon. From the table above, you find that 2 quarts of the formulation are needed per acre to provide the desired dosage.

The tables below provide a quick reference to determine the amount of insecticide to mix with different amounts of water to obtain the same concentration of spray.

Example: **1 cup** of liquid insecticide in **100 gallons** of water makes **the same spray concentration** as **4 tablespoons** in **25 gallons**.

Table 2. For use with liquid insecticide.

Amount of Water Used	Amount of Liquid Insecticide			
100 gallons	1 cup	1 pint	1 quart	2 quarts
50 gallons	0.5 cup	1 cup	1 pint	1 quart
25 gallons	4 tablespoons	0.5 cup	1 cup	1 pint
2.5 gallons	1.5 teaspoons	2.5 teaspoons	5 teaspoons	10 tablespoons
1 gallon	0.5 teaspoon	1.0 teaspoon	2 teaspoons	4 teaspoons

Table 3. For use with wettable powder insecticides.

Amount of Water Used	Amount of Wettable Powder Insecticide			
100 gallons	1 pound	2 pounds	3 pounds	5 pounds
50 gallons	0.5 pound	1 pound	1.5 pounds	2.5 pounds
25 gallons	0.25 pound	0.5 pound	0.75 pound	1.25 pounds
3 gallons	2 tablespoons	3 tablespoons	5 tablespoons	8 tablespoons
1 gallon	2 teaspoons	1 tablespoon	1.5 tablespoons	2.5 tablespoons

Table 4. Read across from the insecticide formulation you have and down from the concentration of the insecticide you want in the spray. The amount of insecticide to mix with 1 gallon of water to make that concentration is indicated at the point the lines meet.

WETTABLE POWDER (WP)

Insecticide Formulation	The Concentration of Actual Chemical Wanted in the Spray Solution								
	0.0313%	0.0625%	0.125%	0.25%	0.5%	1.0%	2.0%	3.0%	5.0%
15% WP	2.5 teaspoons	5.0 teaspoons	10.0 teaspoons	7.0 tablespoons	1.0 cup	2.0 cups	4.0 cups	6.0 cups	10.0 cups
25% WP	1.5 teaspoons	3.0 teaspoons	6.0 teaspoons	12.0 teaspoons	8.0 tablespoons	1.0 cup	2.0 cups	3.0 cups	5.0 cups
40% WP	1.0 teaspoon	2.0 teaspoons	4.0 teaspoons	8.0 teaspoons	5.0 tablespoons	10.0 tablespoons	1.25 cups	2.0 cups	3.25 cups
50% WP	0.75 teaspoons	1.5 teaspoons	3.0 teaspoons	6.0 teaspoons	4.0 tablespoons	8.0 tablespoons	1.0 cup	1.5 cups	2.5 cups
75% WP	0.5 teaspoon	1.0 teaspoon	2.0 teaspoons	4.0 teaspoons	3.0 teaspoons	5.0 tablespoons	10.0 tablespoons	1.0 cup	2.0 cups

EMULSIFIABLE CONCENTRATE (EC)

Insecticide Formulation	The Concentration of Actual Chemical Wanted in the Spray Solution								
	0.0313%	0.0625%	0.125%	0.25%	0.5%	1.0%	2.0%	3.0%	5.0%
10%-12% EC 1 pound actual/gal	2.0 teaspoons	4.0 teaspoons	8.0 teaspoons	16.0 teaspoons	10.0 tablespoons	2/3 pint	1 1/3 pints	1.0 quart	3.25 pints
15%-20% EC 1.5 pounds actual/gal	1.5 teaspoons	3.0 teaspoons	6.0 teaspoons	12.0 teaspoons	7.5 teaspoons	0.5 pint	1.0 pint	1.5 pints	2.5 pints
25% EC 2 pounds actual/gal	1.0 teaspoons	2.0 teaspoons	4.0 teaspoons	8.0 teaspoons	5.0 tablespoons	10.0 tablespoons	2/3 pint	1.0 pint	1.75 pints
33%-35% EC 3 pounds actual/gal	0.75 teaspoon	1.5 teaspoons	3.0 teaspoons	6.0 teaspoons	4.0 tablespoons	8.0 tablespoons	0.5 pint	0.75 pint	1 1/3 pints

Insecticide Formulation	The Concentration of Actual Chemical Wanted in the Spray Solution								
	0.0313%	0.0625%	0.125%	0.25%	0.5%	1.0%	2.0%	3.0%	5.0%
40%-50% EC 4 pounds actual/gal	0.5 teaspoon	1.0 teaspoon	2.0 teaspoons	4.0 teaspoons	8.0 teaspoons	5.0 tablespoons	10.0 tablespoons	0.5 pint	4/5 pint
57% EC 5 pounds actual/gal	7/16 teaspoon	7/8 teaspoon	1.75 teaspoons	3.5 teaspoons	7.0 teaspoons	0.5 tablespoons	9.0 tablespoons	14.0 tablespoons	1.5 cups
60%-65% EC 6 pounds actual/gal	3/8 teaspoon	0.75 teaspoon	0.5 tablespoons	1.0 tablespoons	2.0 tablespoons	4.0 tablespoons	8.0 tablespoons	12.0 tablespoons	1.5 cups
70%-75% EC 8 pounds actual/gal	0.25 teaspoon	0.5 teaspoon	1.0 teaspoon	2.0 teaspoons	4.0 teaspoons	8.0 teaspoons	5.0 tablespoons	7.5 tablespoons	13.0 tablespoons

Trade Names Used in Guide

Common Name	Trade Name	Chemical Name	IRAC Classification	Company
abamectin	Abba Abathor Affirm Agri-Mek Avid CAM-MEK Dynamec Epi-Mek Reaper Timectin Vertimec Zephyr	a mixture of avermectin B1a (10E,14E,16E,22Z)-(1R,4S,5′S,6S,6′R,8R,12S,13S,20R,21R,24S)-6′-[(S)-sec-butyl]-21,24-dihydroxy-5′,11,13,22-tetramethyl-2-oxo-(3,7,19-trioxatetracyclo[15.6.1.14,8.020,24]pentacosa-10,14,16,22-tetraene)-6-spiro-2′-(5′,6′-dihydro-2′H-pyran)-12-yl 2,6-dideoxy-4-O-(2,6-dideoxy-3-O- methyl-α-L-arabino-hexopyranosyl)-3-O-methyl-α-L-arabino-hexopyranoside and avermectin B1b (10E,14E,16E,22Z)-(1R,4S,5′S,6S,6′R,8R,12S,13S,20R,21R,24S)-21,22-dihydroxy-6′-isopropyl-5′,11,13,22-tetramethyl-2-oxo-(3,7,19-trioxatetracyclo[15.6.1.14,8.020,24]pentacosa-10,14,16,22-tetraene)-6-spiro-2′-(5′,6′-dihydro-2′H-pyran)-12-yl 2,6-dideoxy-4-O-(2,6-dideoxy-3-	6	AMVAC Parsons Pest Man. Sunwell Syngenta Syngenta CAM CO. Syngenta Syngenta Loveland Tide International Syngenta Syngenta
acephate	Orthene Surrender FateSystemic Insect Con.	O,S-Dimethyl acetylphosphoramidothioate	1B	AMVAC Martin's Future Crop Sci. Bonide LoveLand
acetamiprid	Assail Intruder Tristar	N-[(6-chloro-3-Pyridy) methyl] –n2-Cyanogen -n- methylacetamidine	4A	United Phos. AgNova Nufarm
allethrin	Pynamin	(RS)-3-allyl-2-methyl-4-oxocyclopent-2-enyl(1RS)-cis-transchrysanthemate; also referred to as allyl homolog of cinerin I.	3A	Sumitomo Chemical Co. Ltd.
amitraz	Taktic	N-methylbis(2,4-xylyliminomethyl)amine	19	InTerveT, Inc.
aluminum phosphide	Phostoxin	aluminum phosphide (AIP)	24A	Degesch America
Bacillus sphaericus	VectoLex	Serotype (H-5a5b)	11	Valent BioSciences Corp.
Bacillus thuringiensis	Biobit Condor Crymax DiPel Javelin Thuricide XenTari	Spores and crystalline delta-endotoxin as A.I. which are produced by *Bacillus thuringiensis* spp. k*urstaki*, Serotype H-3a3bin fermentation.	11A	Valent USA Certis USA Certis USA Valent USA Certis USA OHP Inc. Valent USA
Bacillus thuringiensis	VectoBac	Crystalline delta-endotoxin as A.I. (produced by fermentation of *Bacillus thuringiensis* spp. *israelensis*, Serotype H-14)	11	Valent BioSciences Corp.

Common Name	Trade Name	Chemical Name	IRAC Classification	Company
beta-cyfluthrin	Baythroid Tempo Ultra	cyano(4-fluoro-3-phenoxyphenyl)methyl 3-(2,2- dichloroethenyl-2 2-dimethylcyclopropanecarboxylate (CAS 9CI)	3A	Bayer Corp. Bayer Corp.
bifenazate	Floramite	hydrazine carboxylic acid, 2-(4-methoxy-[1'1-biphenyl]-3-yl)-1 methylethyl ester (CA)	25	OHP Inc.
bifenthrin	Brigade Capture Discipline Fanfare Talstar	[1α,3α-(Z)]-(±)-(2 methyl[1,1'-biphenyl]-3-yl)methyl 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-cyclopropanecarboxylate(CAS)	3A	FMC FMC AMVAC Adama FMC
bifenthrin + imidacloprid	Brigadier	(2-methyl[1,1'-biphenyl]-3-yl)methyl (1R,3R)-rel-3-[(1Z)-2-chloro-3,3,3-trifluoro-1-propen-1-yl]-2,2-dimethylcyclopropanecarboxylate and (2E)-1-[(6-chloro-3-pyridinyl)methyl]-N-nitro-2-imidazolidinimine	3A + 4A	FMC
buprofezin	Applaud Talus	2-tert-butylimino-3-isopropyl-5-phenyl-1,3,5-thiadiazinan-4-one	18	Corteva SePRO
carbaryl	Sevin	1-napthyl methylcarbamate	1A	GardenTech
chlorantraniliprole	Acelepryn Coragen Prevathon Vantacor	3-bromo-N-[4-chloro-2-methyl-6-[(methylamino)carbonyl] phenyl]-1-(3-chloro-2-pyridinyl)-1H-pyrazole-5-carboxamide	28	DuPont Dupont FMC Corp FMC Corp
chlorfenapyr	Intrepid Phantom Pylon 2SC	4-bromo-2-(4-chlorophenyl)-1-(ethoxymethyl)-5-(trifluoromethyl)-1H-pyrrole-3-carbonitrile	13	BASF
chlorpyrifos	Dursban Pro Lorsban Nufos	O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl)phosphorothioate	1B	Corteva Corteva FMC Corp
clothianidin	Arena Belay Poncho	(E)-1-(2-chloro-1,3 thiazo)-5-ylmethyl)-3-methyl-2 nitroguanidine	4A	Valent Valent Bayer
coumaphos	Co-Ral	O,O-diethyl O-(3-chloro-4-methyl-2-oxo2H-1-enzopyuran 7-yl-phosphorothioate	1B	Bayer Corp.
coumpahos + diazinon	Co-Ral Plus	O,O-diethyl O-(3-chloro-4-methyl-2-oxo2H-1-enzopyuran 7-yl-Phosphorothioate + O,O,Diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl)	1B	Bayer Corp.
cyromazine	Citation	N-cyclopropyl-1,3,5-triazine-2,4,6-triamine	17	Syngenta
diazinon	Optimizer Patriot	O,O,Diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl)	1B	Y-Tex Corp. Bayer Corp
diazinon + chlorpyrifos	Warrior (ear tag)	O,O,Diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl)	1B	Y-Tex
dichlorvos	Nuvan Vapona	2,2-dichlorovinyl dimethyl phosphate (IUPAC)	1B	AMVAC Bayer Corp

Common Name	Trade Name	Chemical Name	IRAC Classification	Company
dicofol	Kelthane	2,2,2-trichloro-1,1-bis(4-chlorophenyl)ethanol(IUPAC)	3	Corteva
dicrotophos	Bidrin	(E)-2-dimethylcarbamoyl-1-methylvinyl dimethyl phosphate (IUPAC)	1B	AMVAC
diflubenzuron	Vigilante	N-[(4-Chlorophenyl)amino]carbonyl-2,6-Difluorobenzamide	15	Chemtura Corp.
dimethoate	Cygon Cygon 2E	O,O-dimethyl S-(N-methylcarbamoylmethyl	1B	Bonide Hi-Yield
dioxathion	Del-Tox	2,3-p-dioxanedithion-S,S-bis-(O,O-diethyl phosphrodithioate)	1B	AgrEvo
disulfoton	Di-Syston	O,O-diethyl S-[2-(ethylthio)ethyl]phosphorodithioate (CAS)	1B	Bayer Corp.
endosulfan	Phaser	6,7,8,9,10,10-herachloro-1,5,5a,6,9,9a- hexahydro-6,9-methano-2,4,3-benzodioxathiepin 3-oxide (IUPAC)	2A	Aventis CropScience
eprinomectin	Eprinex	(4’’R)-4”-(Acetylamino)-4”-deoxy-avermectin B1	6	Merck Agvet
esfenvalerate	Asana XL	(S)-α-cyano-3- phenoxybenzyl) (S)-2-(4-chlorophenyl)3- methylbutyrate (IUPAC); (S)-cyano(3-phenoxyphenyl)methyl (S)-4-chloro-α(1-methylethyl)benzeneacetate (CAS)	3A	Dupont
etoxazole	Zeal	2-(2,6-difluorophenyl)-4-[4-(1,1-dimethylethyl)-2-ethoxyphenyl]-4,5-dihydrooxazole	10B	Valent USA
fenbutatin-oxide	Vendex	hexakis(2-methyl-2-phenylproply)distannoxane(CAS)	12B	UPI
fenoxycarb	Award Logic	(ethyl [2-4 phenoxyphenoxy ethyl] carbamate)	7B	Syngenta Syngenta
fenthion	Spotton	O,O-Dimethyl O-[3-methyl-4-(methylthio)phenyl]phosphorothioate	1B	Bayer Corp.
fipronil	Ceasefire Chipco Choice Regent Over ‘n Out Termidor Top Choice	[5-amino-1-(2,6-dichloro-4-trifluoromethyl)phenyl-4-(1,R,S)-(trifluoromethyl)su-1-H-pyrasole-3-carbonitrile]	2B	Bayer BASF
flonicamid	Carbine	N-cyanomethyl-4-(trifluoromethyl) nicotinamide	9C	FMC
gamma-cyhalothrin	Prolex	Cyclopropanecarboxylic acid, 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl,cyano(3-phenoxyphenyl) methyl ester	3A	Pytech
halo fenozide	Mach 2	N-tert-butyl-N'-(4-chlorobenzoyl)benzohydrazide; benzoic acid,4-chloro-2 benzoyl-2-(1,1-dimethylethyl) hydrazide	18	Corteva
hydramethylnon	Amdro	Tetrahydro-5, 5-dimethyl-2 (1H)-pyrimidinone[3-[4(trifluoromethyl) phenyl]-1-[2-[4-(trifluoromethyl)phenyl]etheny]-2-propenylidene]hydrazone	20A	AMBRANDS

Common Name	Trade Name	Chemical Name	IRAC Classification	Company
imidacloprid	Admire Gaucho Marathon Merit Premise	1-(6-chloro-3-pyridin-3-ylmethyl)-N-nitroimidazolidin-2- ylidenamine (IUPAC)	4A	Bayer Corp Bayer Corp OHP Inc. Bayer Corp Bayer Corp
imidacloprid + beta-cyfluthrin	Leverage	(2E)-1-[(6-chloro-3-pyridinyl) methyl]-N-nitro-2-imidazolidinimine + cyano(4-fluoro-3-pheno xyphenyl)methyl 3-(2,2-dichloroethenyl)-2,2-dimethyl cyclopropanecarboxylate	3A + 4A	Bayer Corp
insecticidal soap	M-PEDE Safer	potassium salts of fatty acids	unknown	Gowan Safer
indoxacarb	Advion Steward	(S)-methyl 7-chloro-2,5-dihydro-2-[{(methoxy-carbonyl){4trifluoromethoxy)phenyl}amino}-carbonyl}indeno{1,2-e}[1,3,4}oxadiazine-4a-(3H)-carboxylate	22A	DuPont FMC Corp.
isofenphos	Oftanol	1-methylethyl 2[(ethoxy)(1methylethyl)amino]phosphinothioyl oxy benzoate (CAS)	1B	Bayer Corp.
lambda-cyhalothrin	Battle Commodore Karate Z Saber Warrior T	α-cyano-3-phenoxybenzyl 3-(2-Chloro-3,3,3- trifluoroprop-1-enyl)-2,2-dimethylcyclopropane-carboxylate	3A	Lesco Syngenta Syngenta Merck Syngenta
lambda-cyhalothrin + PBO	Saber Extra (ear tag)	α-cyano-3-phenoxybenzyl 3-(2-Chloro-3,3,3-trifluoroprop-1-enyl)-2,2-dimethylcyclopropane-Carboxylate	3A	Merck
lambda-cyhalothrin+ thiamethoxam	Endigo	Combination of lambda-cyhalothrin and thiamethoxam (premix): [1α(S),3α(Z)]-(±)-cyano-(3-phenoxyphenyl)methyl-3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylate and 3-[(2-chloro-5-thiazolyl)methyl]tetrahydro-5-methyl-N-nitro-4H-1,3,5-oxadiazin-4-imine	3A + 4A	Syngenta
malathion	Fyfanon	diethyl (dimethoxythiophosphorylthio)succinate	1B	Cheminova, Inc.
mancozeb	Dithane	coordination product of zinc ion, manganese ethylene bisdithiocarbamate related to both maneb and zineb	M3	Corteva
methidathion	Supracide	S-2,3-dihydro-5-methoxy-2-oxo1,3,4-thiadiazol-3-ylmethyl O,O-dimethyl-phosphorodithioate(IUPAC)	1B	Gowan Company
methiocarb	Slugger	3,5-dimethyl-4-(methylthio)phenyl methylcarbamate (CAS)	1A	OR-CAL
methomyl	Lannate	S-methyl N-[(methylcarbamoyl)oxy]thioacetimidate (CAS 8CI)	1A	DuPont
methoxyfenozide	Intrepid	Benzoic acid, 3-methoxy-2-methyl, 2-(3,5-dimethylbenzoyl)-2-(1,1-dimethyethyl) hydrazide	18	Corteva
mineral oil	TriTek	mineral oil	unknown	Brandt

Common Name	Trade Name	Chemical Name	IRAC Classification	Company
naled	Dibrom Trumpet	1,2-dibromo-2,2-dichloroethyl dimethyl phosphate	1B	AMVAC AMVAC
novaluron	Diamond	*N*-[[[3-chloro-4-[1,1,2-trifluoro-2-(trifluoromethoxy) ethoxy]phenyl]amino]carbonyl]-2,6-difluorobenzamide	15	Adama
oxamyl	Vydate	S-methyl N' N'-dimethyl-N-(methylcarbamoyloxy)-1-thio-oxamimidate(IUPAC)	1A	Corteva
permethrin	Ambush Astro DeLice Permanone Pounce	3-phenoxybenzyl (1RS)-cis, trans-3-(2,2- dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate (IUPAC)	3A	Syngenta FMC Coopers Bayer Corp FMC
phorate	Thimet	O,O-Diethyl S-[(ethylthio)methyl]phosphorodithioate (CAS)	1B	Amvac Chemical
phosmet	Imidan	S-[(1,3-dihydro-1,3-dioxo-2H-isoindol-2-yl)methyl]O,O-dimethyl phosphorodithioate(CAS 9CI)	1B	Gowan Company
propargite	Comite	sulfurous acid,2[4(1,1-dimethyl-ethyl)phenoxy]cyclohexy1-2- propanyl sulfite (CAS 9C1)	12C	Uniroyal Chemical/ Crompton Corp.
propoxur	Baygon	2-(1-methylethoxy)phenyl methylcarbamate(CAS)	1A	Bayer Corp.
pyriproxyfen	Distance	(2-[1-methyl-2-(4-phenoxyphenoxy)ethoxy]pyridine)	7C	Nufarm
pyrethrin	Pyrethrin	Pyrethrin (natural product)	3A	several
s-methoprene	Altosid Extinguish	isopropyl (E,E)-(RS)-11-methoxy-3,7,11-trimethyl-dodeca-2,4- dienoate (IUPAC)	7A	Wellmark International Phoenix Environmental Design
s-methoprene, + hydromethylnon	Extinguish Plus	(s)-methoprene[isopropyl (2E, 4E, 7S)-11-methoxy-2,7,11-trimethyl-2,4-dodecadienoate] + tetrahydro-5, 5-dimethyl-2 (1H)-pyrimidinone [3-[4(trifluoromethyl)phenyl]-1-[2-[4-(trifluoromethyl)phenyl]etheny]-2-propenylidene]hydrazone	7A	Phoenix Environmental Design
spinetoram	Radiant	Mixture of spinetoram-J and spinetoram-L	5	Corteva
spinosad/spintor	Conserve SC Entrust Success Tracer	Spinosyn A and Spinosyn D	5	Corteva
spiromesifen	Forbid 4F Oberon	2-oxo-3-(2,4,6-trimethylphenyl)-1-oxaspiro[4,4]non-3-en-4-yl3, 3 dimethylbutanoate	23	Bayer Corp Bayer Corp
tebufenozide	Confirm Mimic	N-tert-butyl-N'-(4-ehylbenzoyl)-3,5-dimethylbenzo-hydrazide (IUPAC);3,5-dimethylbenzoic acid 1-(1,1-dimehtylethyl)-2-	18	Corteva Bayer
tefluthrin	Force	(2,3,5,6-tetrafluoro-4-methylphenyl)methyl-(1a,3a)-(Z)-3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylate	3A	Syngenta

Common Name	Trade Name	Chemical Name	IRAC Classification	Company
temephos	Abate	O,O' -(thiodi-4,1-phenylene) O,O, O' O'-tetramethyl phosphorothioate	1B	BASF Corp.
terbufos	Counter	S-[(1,1-Dimethylethyl thio)methyl]O,O-diethyl phosphorodithioate (CAS)	1B	AMVAC
tetrachlorvinphos	Rabon	2-chloro-1-(2,3,5 trichlorophenyl) dimethyl phosphate vinyl	1B	Bayer Livestock
tetrachlorvinphos + dichlorvos	Ravap	(Z)-2-chloro-1-(2,4,5-trichlorophenyl) vinyl dimethyl phosphate + 2,2-dichlorovinyl dimethyl phosphate (IUPAC)	1B	Bayer Livestock
thiamethoxam	Centric Meridian	3-[(2-chloro-5-thiazolyl)methyl] tetrahydro-5-methyl-N-nitro-4H-1,3,5-oxadiazin-4-imine	4A	Syngenta Syngenta
tralomethrin	Scout X-Tra	(1R, 3S) 3 [(1'RS)(1',2',2',2',-tetrabromoethyl)]-2,2-dimethylcyclopropanecarboxylic acid (S)-a-cyano-3-phenoxybenzyl ester (CAS)	3A	Aventis CropScience
zeta-cypermethrin	Mustang	☐-Cyano(3-phenoxyphenyl)methyl (±)-cis-trans3-(2,2dichloroethenyl)-2,2-dimethylcyclopropane carboxylate (CAS)	3A	FMC Corp
zeta-cypermethrin + bifenthrin	Hero Mustang Maxx	α-Cyano(3-phenoxyphenyl)methyl (±)-cis-trans3-(2,2 dichloroethenyl)-2,2-dimethylcyclopropane carboxylate (CAS) +[1a,3a-(Z)]-(±)-(2 methyl[1,1¢-biphenyl]-3-yl)methyl 3-(2-chloro-3,3, 3-trifluoro-1-propenyl)-2,2-dimethyl-cyclopropanecarboxylate(CAS)	3A	FMC Corp

NOTE: This list is presented for information only. No endorsement is intended for products mentioned nor is criticism meant for products not mentioned.

Worker Protection Standard (WPS)

The Environmental Protection Agency (EPA) Agricultural Worker Protection Standard (WPS) is aimed at reducing the risk of pesticide poisoning and injury among agricultural workers and pesticide handlers. Pesticide applicators must comply with this OSHA regulation when using agricultural use pesticide products that reference the Worker Protection Standard, 40 CFR 170. In 2015, the EPA made major revisions to the Worker Protection Standard (WPS).

The LSU AgCenter has since worked to provide an updated WPS Train-the-Trainer program that is approved by the EPA. In Louisiana, those employers who wish to train their own workers and handlers (or other workers and handlers on nearby agricultural establishments) must be certified pesticide applicators and have been trained in the new WPS Train-the-Trainer program provided through the LSU AgCenter. Note: all agricultural workers and handlers (who work with or around applied pesticides and who work for one of these four establishments: farm, forest, plant nursery or greenhouse operation) must be trained on a yearly basis with approved training materials.

If a pesticide applicator who has had “WPS Trainer status” has attended a WPS Train-the-Trainer program prior to November 2016, then he or she must attend an updated WPS Train-the-Trainer program. Once this training has been completed, the “WPS Trainer” category will be added to the back of their pesticide certification card. This WPS Trainer certification will be renewed when they attend their normal pesticide applicator recertification meeting, on their three-year recertification cycle. Training dates and locations can be found at www.lsuagcenter.com/pesticide. (Select the WPS tab.)

If you would like to receive WPS Train-the-Trainer training so that you will be certified to administer WPS worker/handler training to workers who perform work around or with agricultural pesticide products, please email LSUAGPSEP@agcenter.lsu.edu and someone at the LSU AgCenter’s Pesticide Safety Education Program will assist you.

As part of the revised rule there are a few things that need to be pointed out:

- Workers and handlers must be trained every 12 months.
- WPS trainers must participate in the new EPA-approved Train-the-Trainer Program (See information above).
- Workers and handlers must be trained by using EPA-approved training materials
- No longer using the card system for records of training. You must maintain the following worker/handler annual training information:
    - Trained worker’s printed name and signature.
    - Date of the training.
    - Information identifying which EPA-approved training materials were used.
    - The trainer’s name (and certification number) and qualification to train.
    - The worker or handler employer’s name.
- The LSU AgCenter has created a record-keeping form that you are welcome to use. If you would like to download a training verification form for WPS, please do so by going to the LSU AgCenter’s PSEP website (within the WPS tab).
- Must retain records of training of workers and handlers for at least two years.
- Maintain the following information at a central location:
    - New safety poster https://npsecstore.com/collections/posters.
    - Application records.
    - Emergency medical contact information.
    - SDS (safety information).
- When using a pesticide that requires a respirator, employers must:
    - Have an employee medically evaluated by a physician or other licensed healthcare professional.
    - Have employees go through an annual fit test for each type of respirator required by the pesticide product label.
    - Have the employee participate in annual training on how to properly use the respirator(s).
    - Maintain records for two years of the completion of the above, respirator requirements.

The ***How to Comply Manual*** is a great reference guide and can be ordered at www.npsecstore.com.

To get more information about the WPS revised rule you will need to refer to the final rule at https://www.epa.gov/pesticide-worker-safety/agricultural-worker-protection-standard-wps.

Where to get updated information:

- www.lsuagcenter.com/pesticide
- https://npsecstore.com/ (for the new poster and other important WPS materials)
- https://www.pesticideresources.org/ (to get EPA approved worker/handler training materials)

This section was revised by Bryan Gueltig.

Insect Identification Services

The LSU AgCenter, LSU Department of Entomology, and Louisiana State Arthropod Museum (LSAM) offer insect identification services for the citizens and stakeholders of Louisiana.

Due to the diversity of insects in our state and the diversity of places where insects are found, we have established a standard operating procedure to best serve you. If you have an insect (or arthropod) that you are concerned about, either for crop health, garden health, or personal health reasons, please follow the steps below. Note: Although we are interested in all insects, please refrain from submitting specimens that are simply interesting or curious to you! The internet is a great source of information, and we do our best to provide services to insects of potential impact.

Identification Procedure

1. Either photograph or collect the insect in the appropriate manner (requirements provided below). Note: if you have an infestation or more than one insect is present, it is often useful to image or collect several, as this may assist in identification.
2. Submit the image or specimen and associated data to your parish/county extension agent. A complete list of agents is available here: https://www.lsuagcenter.com/portals/it/find-your-agent
3. The parish/county agent will respond with identification and specimens of particular importance will be sent to the Department of Entomology at LSU for confirmation and/or vouchering.
4. In the event the parish agent cannot successfully identify the insect, he/she will contact Victoria Bayless, Curator of the LSAM, and state insect identifier. She will work with the parish agent, faculty, and staff in the Department of Entomology to identify the specimen.

Photo Requirements

In order to provide a ***rapid*** and ***accurate*** identification, we have requirements necessary for all submissions. Any submissions not meeting these minimum requirements can result in delays in identification or an inability to provide an accurate and confident response.

Photos of Insects - Requirements

1. The insect is in-focus (not blurry)
2. There is something for scale included in the image (a coin, a pen/pencil, ruler, etc.)
3. Appropriate data is provided with the image
    - Date image was taken.
    - Location of the image (parish + nearest town are good, GPS coordinates are best).
    - Submitter's contact information, including name, phone, email, and address.
    - Additional notes that may be helpful, including where the insect was collected, why it is a suspected pest, etc.

The submission portal for images and associated information is here:

http://forms.lsuagcenter.net/form.aspx?pid=55d2084f-b9d4-4d70-8ba5-186f35f6fc5e&formid=f4e73049-df5c-4e7d-8313-2d03b7125962

Dead Specimen Requirements

Submission of the actual insects themselves is the best way to receive a confident identification. This process takes time, however, and some important requirements must be followed to make an identification as quickly as possible. Note: we will not accept any bodily tissues or fluids. If the samples appear to be unhygienic and/or pose a health concern, we will incinerate without identification.

- In order to kill an insect, simply collect into a sealed container (plastic zipper baggie, pill bottle, etc.) and freeze for several hours (overnight preferred). Insects are extremely hardy and may re-animate if not frozen for at least several hours!
- If the insect is soft-bodied ("squishy," e.g., caterpillars, fly maggots, etc.), they can be placed in a sealed container of rubbing alcohol, ethanol, or even white vinegar for preservation. If this is not done, the specimens will shrivel, likely making identification impossible.

Insect Specimens - Requirements

1. The insect is dead and in a sealed container (see above).
2. Appropriate data is provided with the insect
    - Date collected.
    - Location where insects were collected (parish + nearest town are good, GPS coordinates are best. When possible, please use decimal degrees to four decimal places).
    - If the insect is in fluid, you *must state* what the fluid is (e.g., rubbing alcohol).
    - Submitter's contact information, including name, phone, email, and address.
    - Additional notes that may be helpful, including where the insect was collected, why it is a suspected pest, etc.
3. Ship specimen(s) to the address below. If the specimen is in rubbing alcohol or ethanol, please ensure it is packaged appropriately to avoid leakage.

Specimens should be sent to the following address:
Insect Identification Services
c/o Department of Entomology, LSAM
404 Life Sciences Building, Louisiana State University
Baton Rouge, LA 70803

Insect Identifiers for Louisiana State University Entomology Department

When mailing large specimens please send as complete and non-damaged a specimen as possible. For microscopic specimens please follow the guidelines below. Photographs can be sent directly to the emails below.

Stephen Baca: Insect Identification (Physical Specimens and Photo ID), life history and general control.
Email: sbaca@agcenter.lsu.edu
Assistant Professor and Director of the Louisiana State Arthropod Museum
Office: 225-578-1813
Mail specimens to Entomology Department
402 Life Sciences Rm 404, Baton Rouge, LA 70803 with email indicating you have specimens being delivered.

Chris Carlton: Insect Identification (Photo ID), life history, no chemical control recommendations.
Email: ccarlt@lsu.edu

Victoria Bayless: Insect and Spider identification no chemical control recommendations (Physical Specimens and Photo ID).
Email: vbayless@agcenter.lsu.edu
Send specimens to: PO Box 139, Rosedale, LA 70772 with email indicating you have specimens being delivered.
Office: 225-578-1634

Kristen Healy: Public health entomology, medical entomology, and pollinators; some control recommendations.
Email: khealy@lsu.edu
Office: 225-578-7386

Karen Sun: Identification of termites and ants; some control recommendations.
Email is preferred method of contact
Email: qsun@agcenter.lsu.edu
Office: 225-578-1831

Aaron Ashbrook: Urban and Peri-urban insects, household, gardens, lawns; some control recommendations.
Email: aashbrook@agcenter.lsu.edu
Office: 225-578-1634

Mike Stout: General questions about the Entomology Department, agricultural pests
Email: mstout@agcenter.lsu.edu
Office: 225-578-1634

2025 Louisiana Field Crops Insect Pest Management Guide

Cover photos by James Villegas

Visit our website:
www.LSUAgCenter.com

Visit our online store:
www.LSUAgCenter.com/OnlineStore

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The LSU AgCenter and LSU provide equal opportunities in programs and employment.