GRAIN SORGHUM INSECT CONTROL

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A new pest of sorghum, the **sugarcane aphid** (*Melanaphis sacchari*) was found for the first time in South Carolina in October 2014. This invasive species was first detected in the continental United States in Florida in 1977 and in Louisiana in 1999 on sugarcane where it remains a minor pest.

The insect switched hosts in 2013 and was found on grain and forage sorghum in Texas. This new strain or biotype was also found in Mississippi in 2013, and it rapidly spread in 2014 to Arkansas, Tennessee, Alabama, Georgia, and South Carolina. It is currently unknown if the aphid can successfully overwinter in South Carolina. However, the insect was able to successfully infest sorghum fields in South Carolina in 2015 and 2016, in addition to spreading to many new states. The dark cornicles (tail pipes) and dark tarsi (feet) differentiate this species from the other main pest species of aphids in sorghum.

The sugarcane aphid can cause significant economic damage to sorghum. The insect feeds on plant sap and can seriously injure or kill plants. While feeding, aphids secrete a sticky substance called honeydew which can cover plants and cause problems with harvesting. Since 2015, infestations of sugarcane aphids have been severe enough in some fields in South Carolina to cause complete crop failure, though on average, yield losses were less across the state. Research trials at the Pee Dee and Edisto RECs are focusing on assessing the impact of this pest on sorghum in South Carolina and providing management recommendations.

Labeled products for control of aphids on sorghum include chlorpyrifos and dimethoate, but, often, these products only provide fair control, and pre-harvest intervals are lengthy (30 and 28 days, respectively, at the lowest rates). Data from trials in South Carolina indicate that dimethoate provide poor levels of control, and chlorpyrifos provided fair levels of control, though a high rate may be needed with heavy infestations. Pyrethroids will flare populations of aphids by reducing numbers of their natural enemies, so they should not be used when sugarcane aphids are present. The new insecticide Sivanto (flupyradifurone) is labeled on sorghum in South Carolina. Under FIFRA section 2(ee), a reduced rate (4-7 oz of product per acre) of Sivanto is available for control of sugarcane aphid on sorghum. This insecticide provided very good levels of control in our trials.

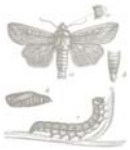
In 2015 and 2016, a section 18 Emergency Exemption was approved for Transform (sulfoxaflor) in South Carolina. While this product provides good control, the section 18 Emergency Exemption expires on 8 April 2017. As of writing (December 2016), Transform is not approved for use on grain sorghum for the 2017 growing season. The only recommended insecticides are therefore Sivanto (very good control) and chlorpyrifos (fair to good control).

Because sugarcane aphids can build up rapidly, fields should be scouted at least once a week, preferably twice a week. Until thresholds are developed with data from South Carolina, thresholds from the mid-South are to be considered, with 20% plants infested with localized areas of heavy honeydey and established aphid colonies until boot. After boot and until dough stage, a threshold of 30% plants infested is to be considered.

In addition to determining the pest status of the sugarcane aphid and exploring insecticide efficacy, research will also focus on developing sampling procedures and economic thresholds, as well as identifying practices that could minimize the need to use insecticides. Grain sorghum hybrids with tolerance to sugarcane aphids can play a major role in slowing the buildup of aphid populations and delaying the need to using insecticides. It is important to note that these tolerant hybrids do not provide 100% control and insecticide applications may still be needed.

R = Restricted use pesticide; REI = re-entry interval; PHI = pre-harvest interval; PGI = pre-grazing interval.

INSECT	PESTICIDE AND FORMULATION	RATE	REI	PHI	PGI	COMMENTS
Aphids (seed insecticide) 	Clothianidin PONCHO 600	5.1-6.4 fl oz /100 lb of seed	-	-	-	Seed treatment
	Imidacloprid GAUCHO 600	6.4fl oz/100 lb of seed	12	45	45	Seed treatment
	Thiomethoxam CRUISER 5FS	5.1-7.6 fl oz / 100 lb of seed	12	-	-	Seed treatment
Aphids (post-emergence insecticides) (all species except sugarcane aphid)	Dimethoate DIMETHOATE 4E DIMETHOATE 400	 0.5-1 pt/ac 0.5-1.5 pt/ac	 48 48	 28 28	 28 28	Use 25-40 gal of water per acre for ground application.
	Chlorpyrifos LORSBAN 4E R CHLORPYRIFOS 4E AG R	 0.5-1 pts/acre 0.5-1 pts/acre	 24 24	 30 30	 30 30	
Sugarcane Aphid	Flupyradifurone SIVANTO	4-7 oz/ac	4	7	21	Use at least 10 gallons/ac for ground applications.
	Chlorpyrifos LORSBAN 4E R CHLORPYRIFOS 4E AG R	 0.5-1 pts/acre 0.5-1 pts/acre	 24 24	 30 30	 30 30	High rate may be needed
Armyworms (post-emergence insecticides) 	Beta-cyfluthrin BAYTHROID XL R	1.3-2.8 oz/ac	12	14	14	
	Carbaryl SEVIN 80S, 80WSP 4F, XLR Plus	 1.25-2.5 lb/ac 1-2 qts/ac	 12 12	 21 21	 14 14	

INSECT	PESTICIDE AND FORMULATION	RATE	REI	PHI	PGI	COMMENTS
Armyworms (post-emergence insecticides) (*cont.*)	Chlorpyrifos LORSBAN 4E R CHLORPYRIFOS 4E AG R	 1-2 pt/ac 1-2 pt/ac	 24 24	30 for 1 pt/ac 60 for 2 pt/ac	30 for 1 pt/ac 60 for 2 pt/ac	For ground application, use at least 15 gal/ac of water.
	Deltamethrin DELTA GOLD 1.5EC R	1.3-1.9 oz/ac	12	14	14	For ground application, use at least 5 gal/ac of water.
	Gamma-cyhalothrin PROAXIS R PROLEX R	2.56-3.84 oz/ac 1.02-1.54 oz/ac	24 24	30 30	30 30	
	Lambda-cyhalothrin KARATE Z R WARRIOR R	1.28-1.92 2.56-3.84 oz/ac	24 24	30 30	30 30	Use higher rates for large larvae.
	Methomyl LANNATE LV R LANNATE SP R	0.75-1.5 pts/ac 0.25-0.5 lbs/ac	48 48	14 14	14 14	Use at least 10 gal. of water per acre for ground application.
	Spinosad TRACER BLACKHAWK	1.5-3 oz/ac 1.7-3.3 oz/ac	4 4	7 7	14 14	Apply at peak egg hatch of each generation.
	Zeta-cypermethrin MUSTANG MAX R	1.76-4.0 oz/ac	12	14	45	Use at least 10 gal. of water per acre for ground application.
Chinch bug (seed insecticide) 	Clothianidin PONCHO 600	5.1-6.4 fl oz /100 lb of seed	-	-	-	Seed treatment
	Imidacloprid GAUCHO 600	6.4fl oz/100 lb of seed	12	45	45	Seed treatment
	Thiomethoxam CRUISER 5FS	5.1-7.6 fl oz / 100 lb of seed	12	-	-	Seed treatment
Chinch bug (at planting)	Chlorpyrifos LORSBAN 15G	8 oz/ 1000 ft of row	24	-	-	Apply in T-band. Suppression only.
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INSECT	PESTICIDE AND FORMULATION	RATE	REI	PHI	PGI	COMMENTS
Chinch bug (post-emergence insecticides) 	Beta-cyfluthrin BAYTHROID XL R	2-2.8 oz/ac	12	14	14	
	Carbaryl SEVIN 80S, 80WSP 4F, XLR Plus	1.25-2.5 lb/ac 1-2 qts/ac	12 12	21 21	14 14	
	Chlorpyrifos LORSBAN 4E R CHLORPYRIFOS 4E AG R	1-2 pts/acre 1-2 pts/acre	24 24	30 for 1 pt/ac 60 for 2 pt/ac	30 for 1 pt/ac 60 for 2 pt/ac	Apply directed toward based of plant with enough water to cover 8 to 12 inch band in center of row. For plants less than 6 inches high, apply band centered over row.
	Deltamethrin DELTA GOLD 1.5EC R	1.3-1.9 oz/ac	12	14	14	For ground application, use at least 5 gal/ac of water.
	Esfenvalerate ASANA XL R	5.8-9.6 oz/ac	12	21	21	Spray at base of plant for best results.
	Gamma-cyhalothrin PROAXIS R PROLEX R	3.84 oz/ac 1.54 oz/ac	24 24	30 30	30 30	Apply directed toward based of plant when insect move from small grains or grass weeds to sorghum.
	Lambda-cyhalothrin KARATE Z R WARRIOR R	1.92 3.84 oz/ac	24 24	30 30	30 30	Apply directed toward based of plant when insect move from small grains or grass weeds to sorghum.
Corn earworm (post-emergence insecticides) 	Beta-cyfluthrin BAYTHROID XL R	1.3-2.8 oz/ac	12	14	14	
	Carbaryl SEVIN 80S, 80WSP 4F, XLR Plus	1.25-2.5 lb/ac 1-2 qts/ac	12 12	21 21	14 14	
	Chlorpyrifos LORSBAN 4E R CHLORPYRIFOS 4E AG R	2 pts/acre 2 pts/acre	24 24	60 60	60 60	For ground application, use at least 15 gal/ac of water.

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INSECT	PESTICIDE AND FORMULATION	RATE	REI	PHI	PGI	COMMENTS
	Deltamethrin DELTA GOLD 1.5EC R	1.0-1.5 oz/ac	12	14	14	For ground application, use at least 5 gal/ac of water.
	Esfenvalerate ASANA XL R	5.8-9.6 oz/ac	12	21	21	
	Gamma-cyhalothrin PROAXIS R PROLEX R	2.56-3.84 oz/ac 1.02-1.54 oz/ac	24 24	30 30	30 30	
	Lambda-cyhalothrin KARATE Z R WARRIOR R	1.28-1.92 2.56-3.84 oz/ac	24 24	30 30	30 30	Use higher rates for large larvae.
	Methomyl LANNATE LV R LANNATE SP R	0.75-1.5 pts/ac 0.25-0.5 lbs/ac	48 48	14 14	14 14	Use at least 10 gal. of water per acre for ground application.
	Spinosad TRACER BLACKHAWK	1.5-3 oz/ac 1.7-3.3 oz/ac	4 4	7 7	14 14	Apply at peak egg hatch of each generation.
	Zeta-cypermethrin MUSTANG MAX R	1.76-4.0 oz/ac	12	14	45	Use at least 10 gal. of water per acre for ground application.
Cutworm 	Chlorpyrifos LORSBAN 15G	8 oz/ 1000 ft of row	24	-	-	Apply in T-band.
	Beta-cyfluthrin BAYTHROID XL R	1-1.3 oz/ac	12	14	14	
	Carbaryl SEVIN 80S, 80WSP 4F, XLR Plus	2.5 lb/ac 2 qts/ac	12 12	21 21	14 14	
	Chlorpyrifos LORSBAN 4E R CHLORPYRIFOS 4E AG R	1-2 pts/acre 1-2 pts/acre	24 24	30 for 1 pt/ac 60 for 2 pt/ac	30 for 1 pt/ac 60 for 2 pt/ac	Apply directed toward based of plant with enough water to cover 8 to 12 inch band in center of row. For plants less than 6 inches high, apply band centered over row.

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INSECT	PESTICIDE AND FORMULATION	RATE	REI	PHI	PGI	COMMENTS
	Deltamethrin DELTA GOLD 1.5EC R	1-1.5 oz/ac	12	14	14	For ground application, use at least 5 gal/ac.
	Esfenvalerate ASANA XL R	5.8-9.6 oz/ac	12	21	21	Spray at base of plant for best results.
	Gamma-cyhalothrin PROAXIS R PROLEX R	1.92-2.56 oz/ac 0.77-1.02 oz/ac	24 24	30 30	30 30	Apply directed toward based of plant when insect move from small grains or grass weeds to sorghum.
	Lambda-cyhalothrin KARATE Z R WARRIOR R	0.96-1.28 1.92-2.56 oz/ac	24 24	30 30	30 30	Apply directed toward based of plant when insect move from small grains or grass weeds to sorghum.
	Zeta-cypermethrin MUSTANG MAX R	1.28-4.0 oz/ac	12	14	45	
Sorghum midge (post-emergence insecticides) 	Beta-cyfluthrin BAYTHROID XL R	1.0-1.3 oz/ac	12	14	14	
	Chlorpyrifos LORSBAN 4E R CHLORPYRIFOS 4E AG R	0.5 pts/acre 0.5 pts/acre	24 24	30 30	30 30	Apply when 30% to 50% of the seed heads are in bloom.
	Deltamethrin DELTA GOLD 1.5EC R	1.3-1.9 oz/ac	12	14	14	For ground application, use at least 5 gal/ac.
	Dimethoate DIMETHOATE 4E	0.25-0.5 pt/ac	48	28	28	Use 25-40 gal of water per acre for ground application.
	Esfenvalerate ASANA XL R	2.9-5.8 oz/ac	12	21	21	
	Gamma-cyhalothrin PROAXIS R PROLEX R	1.92-2.56 oz/ac 0.77-1.02 oz/ac	24 24	30 30	30 30	Apply when 25% of heads have emerged and are in tip bloom.
	Lambda-cyhalothrin KARATE Z R WARRIOR R	0.96-1.28 1.92-2.56 oz/ac	24 24	30 30	30 30	Apply when 25% of heads have emerged and are in tip bloom.

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INSECT	PESTICIDE AND FORMULATION	RATE	REI	PHI	PGI	COMMENTS
Sorghum midge (post-emergence insecticides) (*cont.*)	Methomyl LANNATE LV R LANNATE SP R	 0.75-1.5 pts/ac 0.25-0.5 lbs/ac	 48 48	 14 14	 14 14	Use at least 10 gal. of water per acre for ground application. Apply at 50% bloom.
Sorghum webworm (post-emergence insecticides)	Beta-cyfluthrin BAYTHROID XL R	1.3-2.8 oz/ac	12	14	14	
	Carbaryl SEVIN 80S, 80WSP 4F, XLR Plus	1.25-2.5 lb/ac 1-2 qts/ac	12 12	21 21	14 14	
	Chlorpyrifos LORSBAN 4E R CHLORPYRIFOS 4E AG R	 2 pts/acre 2 pts/acre	 24 24	 60 60	 60 60	For ground application, use at least 15 gal/ac of water.
	Deltamethrin DELTA GOLD 1.5EC R	1.0-1.5 oz/ac	12	14	14	For ground application, use at least 5 gal/ac.
	Gamma-cyhalothrin PROAXIS R	2.56-3.84 oz/ac	24	30	30	
	Lambda-cyhalothrin KARATE Z R WARRIOR R	 1.28-1.92 oz/ac 2.56-3.84 oz/ac	 24 24	 30 30	 30 30	
	Methomyl LANNATE LV R LANNATE SP R	 1.5 pts/ac 0.5 lbs/ac	 48 48	 14 14	 14 14	Use at least 10 gal. of water per acre for ground application.
	Spinosad TRACER BLACKHAWK	1.5-3 oz/ac 1.7-3.3 oz/ac	4 4	7 7	14 14	Apply at peak egg hatch of each generation.
	Zeta-cypermethrin MUSTANG MAX R	1.76-4.0 oz/ac	12	14	45	Use at least 10 gal. of water per acre for ground application.

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INSECT	PESTICIDE AND FORMULATION	RATE	REI	PHI	PGI	COMMENTS
Stink bugs (post-emergence insecticides) 	Beta-cyfluthrin BAYTHROID XL R	1.3-2.8 oz/ac	12	14	14	
	Carbaryl SEVIN 80S, 80WSP 4F, XLR Plus	1.25-2.5 lb/ac 1-2 qts/ac	12 12	21 21	14 14	
	Deltamethrin DELTA GOLD 1.5EC R	1.5-1.8 oz/ac	12	14	14	For ground application, use at least 5 gal/ac of water.
	Gamma-cyhalothrin PROAXIS R PROLEX R	2.56-3.84 oz/ac 1.02-1.54 oz/ac	24 24	30 30	30 30	
	Lambda-cyhalothrin KARATE Z R WARRIOR R	1.28-1.92 oz/ac 2.56-3.84 oz/ac	24 24	30 30	30 30	
	Zeta-cypermethrin MUSTANG MAX R	1.76-4.0 oz/ac	12	14	45	Use at least 10 gal. of water per acre for ground application.
PRE-MIXED or CO-PACKAGED INSECTICIDES						
BRAND NAME	**RATE**	**REI**	**PHI**	**PGI**	**COMMENTS**	
COBALT (chlorpyrifos, gamma-cyhalothrin)	7-42 oz/ac	24	32	1 (green) 21 (fodder)		

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