INSECTICIDE RECOMMENDATIONS FOR GRAIN SORGHUM (MILO)- 2007 ENT-24

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Producing sorghum (milo) for grain is important in many Kentucky farm management systems. Grain sorghum is subject to infestation by a variety of insect pests. However, following a few good production practices can greatly reduce insect pest infestations.

- To establish need and estimate proper timing for grain sorghum insect control, fields should be sampled at least weekly from emergence to maturity.
- Plant at the proper time, usually as soon as possible after the soil temperature reaches 65° - 70°F. (See AGR-18-Grain & Forage Crop Guide for Kentucky). Planting too early may result in infestation by greenbugs and chinch bugs, while late planting will increase problems with sorghum midge, fall armyworm, and sorghum webworm.
- Do not plant in fields infested with Johnson grass.
- Do not make sequential plantings- Strive for even bloom in fields.
- Know the difference between pest and beneficial insects.

Check with your County Extension Agent for Agriculture about training in pest identification, damage thresholds and control measures (Integrated Pest Management and Pesticide Safety Education).

Additional Information

In addition to these recommendations the producer is advised to review **IPM-5, Kentucky IPM Manual for Grain Sorghum**. This publication will provide information about identification, life cycle, scouting techniques, and threshold values for the common pests of soybean. This manual may be found on the IPM web pages at: **http://www.uky.edu/Agriculture/IPM/ipm.htm**.

Additionally, you may find useful information about a specific pest in our ENTFACT series. These fact sheets may be found on the Entomology web pages at: **http://www.uky.edu/Agriculture/Entomology/entfacts.htm** These and other publications and educational materials are also available to the producer through your County Extension Office.

Using Insecticides Properly

Products listed in this publication are not the only products labeled for use. These products are commonly used and generally available in Kentucky. You may find many other products with different trade names containing the same active ingredient. Be sure the product you choose is labeled for the intended use and registered in Kentucky.

This publication is an abbreviated guide; it is not a substitute for a product label. Before using any pesticide, read the entire label. Note the sections containing directions for use, restrictions, and the warning and precautionary statements. The user takes full responsibility for any deviation from label directions. The user should be thoroughly familiar with the proper safety equipment required (i.e. goggles, protection suits, respirators, etc.) to afford maximum protection. It is a good idea for all persons to know exactly what is being applied and at what rate.

Chemicals listed in ***bold italics*** are ***Restricted Use*** pesticides. Persons buying, using, or supervising the use of these pesticides must be certified as competent to do so. Certification training is available from your county extension agent for agriculture. Check http://www.uky.edu/Agriculture/PAT/welcome.htm for information on certification.

Preplant Soil Treatments for Greenbugs

Greenbugs are rarely reported as pests in Kentucky, and if present, are usually the result of planting too early. Preventive treatments are not recommended unless recurrent problems develop. If a problem is anticipated the granular soil applied insecticide***, Temik***, and the seed applied insecticide ***Cruiser*** are labeled for "at planting" use. These products are ***Restricted Use*** and toxic.

Aphids are almost never a problem on Kentucky grown sorghum. Corn leaf aphids are commonly found but do no damage, only greenbugs and yellow sugarcane aphids are of importance. See IPM-5 (listed above) for description and treatment thresholds.

Foliar Treatments f or Greenbugs

Insecticide	Rate per Acre	Days to Harvest or Forage
Dimethoate 4 E (dimethoate)	½ to 1 pt.	28 (Grain, feed, graze) Do not apply after heading
Lorsban 4E (chlorpyrifos)	½ to 2 pt.	30 (½ - <1pt.) or 60 (1-2 pt.) grain, forage, fodder, hay, silage

Foliar Treatments for Sorghum Midge

Insecticide	Rate per Acre	Days to Harvest/Forage
Asana (esfenvalerate)	2.9 – 5.8 fl. oz.	21
Baythroid 2 (cyfluthrin)	1 to 1.3 fl. oz.	14
Dimethoate 4E	1/4 to 1/2 pt.	28 (Grain, feed graze) Do not apply after heading
Lannate SP (methomyl)	1/4 to ½ lb.	14 Grain, grazing or feeding
Lorsban 4E	1/2 pt..	30 grain, forage, fodder, hay, silage
***Mustang* Max** (zeta-cypermethrin)	1.28 to 4.0 fl. oz	14 (Grain & stover) 45 (forage)
Warrior *(lambda cyhalothrin)*	1.92 to 2.56 fl. Oz.	30 (Grain) Do not graze or harvest for feed

Begin scouting for midge as the panicles emerge from the boot. Control will be necessary if populations exceed one per head **during bloom**. Johnson grass, late planting, continuous cropping and large numbers of rogues contribute to increasing sorghum midge numbers.

Foliar Treatments for Corn Earworm, Sorghum Webworm, Fall Armyworms

Insecticide	Rate per Acre	Days to Harvest/Forage
Baythroid 2	1.3 to 2.8 fl. oz.	14
Bacillus thruringensis "B.t."	Aid in control of caterpillars can be obtained using many products containing "**B.t.".** Some examples are Javelin, Dipel and Lepinox. Check labels for details. Days to Harvest = 0.	
Lannate SP	1/4 to ½ lb.	14 Grain, grazing or feeding
Lorsban 4E	1 pt.. Webworm 2 pt. (CEW)	30(1pt..) 60(>pt..) grain, forage, fodder, hay, silage
Mustang Max	1.76 to 4.0 fl. oz	14 (Grain & stover) 45 (forage)
Sevin 80 WSP (carbaryl)	1-1/4 to 2-1/2 lbs.	21(Grain or fodder) 14 (forage or silage)
Tracer (spinosad)	1.5 to 3.0 fl. oz.	7(Grain or fodder) 14(forage or hay)
Warrior	2.56 to 3.84 fl. oz.	30 (Grain) Do not graze or harvest for feed

These insects are primarily head feeders, though some foliage feeding may occur. Treatment is warranted if populations reach 2 small worms per head or if 50% of the plants are infested with fall armyworm feeding in the whorl. Lorsban is not labeled for fall armyworm control.

Foliar Treatments for Grasshoppers

(See: Three Common Kentucky Grasshoppers and their Natural Enemies. Entfact-116.
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Bin Surface Applications

Dilute with water to make enough spray to treat 1,000 sq ft of bin surface. Use only in empty bins.

Tempo SC Ultra (cyfluthrin)	0.27 fl. oz.
Storcide II (chlorpyrifos-methyl + deltamethrin)	1.8 fl. oz in 1 gal water

PESTICIDES APPLIED DIRECTLY ON THE GRAIN

Grain Protectants

Applied directly to stored grain sorghum.
Do not use the same compound for both Bin Surface and Grain protection.

	Amount per 1,000 bushels
Actellic 5E	9.2 - 12.3 fl. oz.
Storcide II	11.6 fl. oz

Grain Surface "Cap Out" Treatments

Applied directly to the top surface of stored Grain Sorghum for control of Indian Meal Moth.
Do not use the same compound for Bin Surface, Grain protection and Cap Out treatments. Rotate insecticide use.

Actellic 5E	3 fl. oz. / 1,000 sq ft (mixed to 4 inches deep)
Biobit HP (B.t.)	3 oz. / 1,000 ft sq (mixed to 4 inches deep)
Dipel DF (B.t.)	1 lbs. / 1,000 ft sq (mixed to 4 inches deep)
Javelin (B.t.)	14 oz / 1,000 sq ft (mixed to 4 inches deep)

Indian meal moth larvae can be controlled by many products containing the active ingredient *Bacillus thuringensis* "B.t.". Biobit Dipel and Javelin are three examples.. B.t. products will not control beetles and weevils.

Note: Indian meal moth adults may be controlled by hanging DDVP Resin strips (Vapona) in the head space over the grain mass. Use 1 strip for each 1,000 cubic feet of air space over the grain. One treatment will last about 3 months.

Bulk Grain Fumigation

To be applied/1,000 bu stored grain sorghum.

Phostoxin (aluminum phosphide)	tablets	40 - 180 / 1,000 bu
	pellets	200 - 900 / 1,000 bu

Note: Economic thresholds are hard to determine for stored grain but these numbers should provide a guide to when fumigation will be profitable. Rice weevil or lesser grain borer 1 insect / qt of grain. Red flour beetle, rusty grain beetle and other bran bugs 5 insects / qt of grain. Successful fumigation includes consideration of many variables, use these fumigant amounts as guide and consult the label of the product you choose.

WARNING: Fumigation is a complicated and dangerous technique. If at all possible hire a commercial fumigator. If a commercial fumigation is not possible consult the label / fumigation manual of the product you have chosen to use and follow it to the letter. Note that aluminum phosphide labels have undergone major revision in recent years and now contains significant requirements for pre-planning and documentation of the fumigation, and access to considerable safety equipment.

Information Summary Table for Grain Sorghum Insecticides

This table is provided for a quick comparison of insecticides labeled on grain sorghum. Insecticides are listed alphabetically by pesticide common name (usually present in the active ingredients section of the product label). One or more brand names are included along with the Restricted Entry Interval (REI) and Mode of Action Group number. Brand names of Restricted Use pesticides appear in ***bold italics***.

Use pesticide products only in accordance with their labels and with the Worker Protection Standard. Do not enter or allow worker entry into treated areas during the restricted entry interval. Check the label for Personal Protective Equipment required for early entry to treated areas that is permitted under the Worker Protection Standard and involves contact with anything that has been treated, such as plants, soil, or water.

Mode of Action Group A numerical classification system has been developed to make it easy to recognize the modes of action of insecticide products. Insecticides with the same mode of action belong to groups with unique numbers. Selection of a labeled product from a different number category (different mode of action) will help to slow down the development of resistance to either group. For example, alternate use of pyrethroid insecticides and pyrethrins sprays (Category 3) with labeled organophosphate insecticides (Category 1B). Always avoid tank mixing products with the same mode of action. These Mode of Action Group codes are on many pesticide labels and have been developed by the Insecticide Resistance Action Committee (IRAC).

Common Name	Brand Name	Restricted Entry Interval (hours)	Mode of Action Group
acephate	Orthene	24	1B
Aluminum phosphide	***Phostoxin, Fumtoxin***	NA‡	8D
Bt kurstaki	Biobit, Dipel DF, Javelin WG, etc.	4	11B2
carbaryl	Sevin	12	1A
chloropicrin	***Chlor-O-Pic***	NA‡	NA
chlorpyrifos	***Lorsban 4E, Warhawk, Whirlwind, Yuma***	24	1B
chlorpyrifos-methyl	Storcide II	NA‡	1B
cyfluthrin	Tempo, **Baythroid, Govern**	NA‡ 12	3 3
deltamethrin	Storcide II	NA‡	1B
lambda-cyhalothrin	***Warrior, Mistic Z, Taiga Z***	24	3
zeta-cypermethrin	***Mustang Max, Mustang***	12	3
dimethoate	Dimethoate 4	48	1B
esfenvalerate	***Asana XL***	12	3
malathion	Cythion, Malathion	12	1B
methyl bromide	***Bromo Gas***	NA‡	8A
methomyl	***Lannate***	48	1A
pirimiphos-methyl	Actellic	NA‡	1B
spinosad	Tracer	4	5

NA Not applicable in the usual sense.
* If the product is soil-injected or soil incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.
** Exceptions apply for corn, sunflowers, and sorghum. See label for details.
‡ For use in storage bins no reentry is allowed. See label for details.

Revised annually — 200 10/07