

# **COTTON - ARMYWORM, COTTON BOLLWORM (POST-BLOOM), ETC.**

## General Information

### PRODUCT INFORMATION

Blackhawk is a Naturallyte insect control product for control of many foliage feeding pests infesting labeled crops. This product's active ingredient, spinosad, is biologically derived from the fermentation of *Saccharopolyspora spinosa*, a naturally occurring soil organism. Mix Blackhawk with water and apply as a foliar spray with aerial or ground equipment equipped for conventional insecticide spraying.

### Use Precautions

#### Integrated Pest Management (IPM) Programs

Blackhawk is recommended for IPM programs in labeled crops. Apply Blackhawk when field scouting indicates target pest densities have reached the economic threshold, i.e., the point at which the insect population must be reduced to avoid economic losses beyond the cost of control. Other than reducing the target pest species as a food source, Blackhawk does not have a significant impact on certain parasitic insects or the natural predaceous arthropod complex in treated crops, including big-eyed bugs, ladybird beetles, flower bugs, lacewings, minute pirate bugs, damsel bugs, assassin bugs, predatory mites or spiders. The feeding activities of these beneficials will aid in natural control of other insects and reduce the likelihood of secondary pest outbreaks. If Blackhawk is tank mixed with any insecticide that reduces its selectivity in preserving beneficial predatory insects, the full benefit of Blackhawk in an I P M program may be reduced.

#### Insecticide Resistance Management (IRM)

Blackhawk contains spinosad, a Group 5 insecticide. Insect/mite biotypes with acquired resistance to Group 5 insecticides may eventually dominate the insect/mite population if Group 5 insecticides are used repeatedly in the same field or area, or in successive years as the primary method of control for targeted species. This may result in partial or total loss of control of those species by

Blackhawk or other Group 5 insecticides. Currently, only spinetoram and spinosad active ingredients are classified as Group 5 insecticides. These two insecticide active ingredients share a common mode of action and must not be rotated with each other for control of pests listed on the label. Spinetoram and spinosad may be rotated with all other labeled insecticide active ingredients.

To delay development of insecticide resistance:

- Carefully follow the specific label guidelines within the use directions sections of the label, especially in regard to IRM recommendations.
- Avoid use of the same active ingredient or mode of action (same insecticide group) on consecutive generations of insects. However, multiple applications to reduce a single generation are acceptable. Treat the next generation with a different active ingredient that has a different mode of action or use no treatment for the next generation.
- Avoid using less than labeled rates of any insecticide when applied alone or in tank mixtures.
- Target applications against early insect developmental stages whenever possible.
- Base insecticide use on comprehensive IPM programs including crop rotations.
- Monitor treated insect populations in the field for loss of effectiveness.
- Contact your local extension specialist, certified crop advisor, and or manufacturer for insecticide resistance management and/or IPM recommendations for the specific site and resistant pest problems.
- For further information or to report suspected resistance, contact your local Dow AgroSciences representative or by calling 800-258-3033.

### Application Directions

Do not apply Blackhawk in greenhouses or other enclosed structures used for growing crops.

Proper application techniques help ensure thorough spray coverage and correct dosage for optimum insect control. The following directions are provided for ground and aerial application of Blackhawk. Attention should be given to sprayer speed and

calibration, wind speed, and foliar canopy to ensure adequate spray coverage.

### Row Crop Application

Use calibrated power-operated ground spray equipment capable of providing uniform coverage of the target crop. Orient the boom and nozzles to obtain uniform crop coverage. Utilize a minimum of 5 to 10 gallons per acre, increasing volume with crop size and/or pest pressure. Use hollow cone, twin jet flat fan nozzles or other insecticide atomizer suitable for insecticide spraying to provide a fine to coarse spray quality (per ASABE S-572, see nozzle catalogs). Under certain conditions, drop nozzles may be required to obtain complete coverage of plant surfaces. Follow manufacturer's specifications for ideal nozzle spacing and spray pressure. Minimize boom height to optimize uniformity of coverage and maximize deposition (optimize on-target deposition) to reduce drift.

### Aerial Application

Apply in a spray volume of 5 gallons or more per acre (10 gallons or more per acre for trees, vines or orchard crops). Nozzle configuration should provide a medium to fine droplet size per ASABE S-572 standard (see USDA-ARS or NAAA handbook). Guidance for ASABE S-572 nozzle configuration can be found at the following web site: [www.cpproductsinc.com](http://www.cpproductsinc.com). Boom length must be less than 75% of wing or 85% of rotor span and swath adjustment (offset) to compensate for crosswinds. Do not make applications more than 10 feet above the top of the target plants unless a greater height is required for aircraft safety. Use GPS equipment, swath markers or flagging to ensure proper application to the target area.

Configure the boom nozzle used (e.g., at NAAA Fly-In) for both crosswind and near parallel winds. If application is made parallel to the wind direction, adjust swath width downward. Use swath adjustment (offset) to compensate for crosswinds. Do not apply under completely calm wind conditions. It is best to apply when wind speed is between 2 to 10 mph.

Under conditions of low humidity and high temperatures, adjust spray volume and droplet size upward to compensate for evaporation of spray droplets. Insect control by aerial application may be less than control by ground application because of reduced coverage.

### Limitations, Restrictions, and Exceptions

## COTTON

### Specific Use Directions:

Cotton bollworm: Post-bloom

Control of thrips may be improved by addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing.

### Application Timing:

Cotton Bollworm: For the most effective control, fields should be scouted twice per week and Blackhawk applied when the majority of the population is within the time of blackhead egg stage to 1/8-inch larval length. Refer in the table of the label with regards to the size of worms in relation to age and stage of development (instar) as a guide to timing treatments for optimum control.

Note: A scouting schedule of only once per week is risky since hatching worms will have grown to 3rd instar before the next scouting observation has determined the need to spray.

Beet Armyworm: Economic thresholds vary with local conditions and sampling methods. The following is an example of one such method: apply Blackhawk when field scouting reveals 3 or more occurrences of egg hatch or larval feeding per 100 feet of row.

Loopers: Economic thresholds vary with local conditions and sampling methods. The following is an example of one such method: apply Blackhawk when field scouting reveals 4 larvae per 1 foot of row or 25% defoliation.

Application Rate: Use a higher rate in the rate range and higher spray volume when one or more of the following is true: tobacco budworms or bollworms are more than 1/4 inch in length; target pest population is 2X above local threshold level; or foliage canopy is tall/dense and worms are present in the lower part of the canopy. Heavy infestations may require repeat applications, but follow resistance management guidelines.

Resistance Management: Do not make more than 2 consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are

required after 2 consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Dow AgroSciences representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area. For tobacco budworm and/or cotton bollworm where early season conservation of beneficial insects is practical, use Blackhawk to control the 1st and 3rd generations of tobacco budworm and/or cotton bollworm. Where conservation of beneficial insects is not as critical (for example, fields have received non-selective early season treatments for boll weevil or lygus bugs), use Blackhawk to control either the 2nd or 3rd generation of tobacco budworm and/or cotton bollworm.

#### Restrictions:

- Minimum Treatment Interval: Do not make applications less than 5 days apart for high rates of application.

#### Method

[Foliar spray](#)

[Directed](#)

[Foliar spray](#)

[Directed](#)

#### Pre-Harvest Interval

28 days

#### Rates

[field rates 0](#)

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#### Restricted Entry Interval

4 hours

#### Timings

[Post-bloom](#)

[When field scouting indicates target pest densities have reached the economic threshold.](#)