

# CoStar®

## BIOLOGICAL INSECTICIDE

For Control of Insect Pests on Fruits, Nuts, Vegetables, Cotton, and Soybeans

 FOR ORGANIC PRODUCTION



### ACTIVE INGREDIENT:

*Bacillus thuringiensis* subspecies *kurstaki* strain SA-12 solids, spores, and insecticidal toxins\*: .....85.0%

OTHER INGREDIENTS: .....15.0%

TOTAL: .....100.0%

\*The percentage active ingredient does not indicate product performance and potency measurements are not federally standardized.

**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

### Net Contents:

Made in the USA  
EPA REG. NO. 70051-69  
EPA EST. NO.: 70051-CA-001  
Lot Number:

Manufactured by  
Certis USA, L.L.C.  
9145 Guilford Road, Suite 175  
Columbia, MD 21046

**CERTIS**

### PRECAUTIONARY STATEMENTS

#### HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)

#### CAUTION

Harmful if inhaled or absorbed through the skin. Avoid breathing vapors or spray mist. Prolonged or frequently repeated skin contact may cause an allergic reaction in some individuals. Avoid contact with skin, eyes or clothing. Causes moderate eye irritation. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash clothing before reuse.

#### FIRST AID

##### If in eyes:

- Hold eyes open and rinse slowly and gently with water for 15 - 20 minutes.
- Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for treatment advice.

##### If on skin or clothing:

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call a poison control center or doctor for treatment advice.

##### If inhaled:

- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.
- Call a poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. Hot Line Number: 1-800-255-3924.

#### Personal Protective Equipment:

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

All mixer/loaders and applicators must wear a dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95 or P-95. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.

#### Engineering controls statements:

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40CFR 170.250 (d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

#### USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and-weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

#### ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

This product must not be applied aerially within 1/4 mile of any habitats of endangered or threatened Lepidoptera. No manual application can be made within 300ft. of any threatened or endangered Lepidoptera.

## DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

Do not allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is:

- Coveralls
- Waterproof gloves
- Shoes plus socks

## DIRECTIONS FOR USE

### CoSTAR BIOLOGICAL INSECTICIDE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

This labeling must be in the possession of the user at the time of the pesticide application.

**NOTICE:** Read "Warranty" on the container or in this Directions for Use section before buying or using. If terms are not acceptable, return at once unopened.

Unless specifically stated, do not apply this product through any type of irrigation system.

CoSTAR® is a biological insecticide specific for the control of lepidopterous larvae (see Application Rates section).

CoSTAR® may be applied up to and on the day of harvest.

### GENERAL USE INSTRUCTIONS

For most consistent control, apply at first sign of newly hatched worms (1st and 2nd instar larvae). Instructions for specific crops are located in ADDITIONAL INSTRUCTION sections under APPLICATION RATES.

Reapply as necessary under a pest management program that includes close scouting.

For heavy worm infestations, use the higher CoSTAR® rate. During situations of dense foliage and/or rapid growth, shorter application intervals and increased water carrier volumes will provide better crop coverage and improve CoSTAR® performance.

If rapid knockdown of heavy worm or non-lepidopterous populations is necessary, include an effective contact insecticide in combination with CoSTAR®. Use tank mixes only in states where the tank mix product and application site are registered.

Read and follow all label directions for use for other pesticides used as tank mix partners with CoSTAR® for specific application rates, application timing, and precautions.

### Mixing:

Fill spray or mixing tank 3/4 full. Turn on agitation and pour CoSTAR® into water while maintaining continuous agitation. Add other spray material (if any) and add balance of water. Agitate as necessary to maintain suspension. Do not allow diluted sprays to remain in the tank for more than 48 hours. CoSTAR® is formulated to provide desirable coverage and adherence to leaf surfaces. Additional adjuvants, spreaders, or stickers may be added to improve product performance, especially under heavy dew or rainy conditions. Combinations with commonly used insecticides, fungicides, or other spray tank adjuvants are generally not deleterious to CoSTAR® if the mix is used promptly. Before mixing in the spray tank, test physical compatibility by mixing all components in a small container in proportionate quantities.

### APPLICATION VOLUMES

CoSTAR® can be applied by ground or air in water sufficient to insure thorough and even coverage. Thorough and uniform crop coverage is required for adequate insect control. Applications at higher water volumes have demonstrated improved control of targeted pests. Early morning or evening applications, when air is calm, are generally best for aerial applications.

### CoSTAR® WILL CONTROL THE FOLLOWING INSECTS WHEN USED AS DIRECTED

Alfalfa caterpillar	Fall webworm	Pecan nut casebearer
Almond moth	Filbert webworm	Redbanded leafroller
Armyworm	Fruit tree leafroller	Redhumped caterpillar
Beet Armyworm	Grape leafroller	Rindworm
Artichoke plume moth	Grapeleaf skeletonizer	Roughskinned cutworm
Bagworm	Green cloverworm	Saltmarsh caterpillar
Banana skipper	Green fruitworm	Sod webworm
Blueberry leafrollers	Gypsy moth	Southwestern corn borer
Blueberry spanworm	<i>Helicoverpa spp.</i>	Spotted cutworm
Bollworm	<i>Heliothis spp.</i>	Spring cankerworm
California oak moth	Hornworms	Spruce budworm
Cherry fruitworm	Imported cabbageworm	Tent caterpillar
Citrus cutworm	Jack pine budworm	Tobacco budworm
Codling moth	Loopers	Tobacco hornworm
Corn Earworm	Mimosa webworm	Tomato fruitworm
Cotton leafworm	Naval orangeworm	Tomato pinworm
Cotton leafperforator	Obliquebanded leafroller	Tropical sod webworm
Cutworm	Ominverous leafroller	Tufted apple bud moth
Diamondback moth	Omniverous leaf-tier	Variiegated leafroller
Douglas-fir tussock moth	Orangedog	Velvetbean caterpillar
Elm spanworm	Orange tortrix	Western tussock moth
European corn borer	Oriental fruit moth	
Fall cankerworm	Peach twig borer	

### RATE SELECTION CONSIDERATIONS

Application rates are typically given as a range:

Use **Lower rate ranges** when tank mixing with contact insecticides labeled for worm control or under conditions of light worm infestations or when uniformly small worms are present.

Use **Medium rate ranges** when multiple worm life stages are present, continuous egg hatches are occurring or young or light armyworm infestations exist.

Use **Upper rate ranges** for heavy worm infestations, mature (larger) worms or for moderate to heavy infestations of armyworm, bollworm or other difficult to control worm species.

Use application rate amount of CoSTAR® in water sufficient to insure thorough coverage depending on type of crop, application equipment and requirements of state regulations. Low volume applications may be used, but proper application equipment must be used to insure adequate coverage. Thorough and uniform crop coverage is required for adequate insect control.

## APPLICATION RATES

CROPS	LBS./ACRE
<b>FRUIT, NUT AND VINE CROPS</b>	
<b>Apples and Pears</b>	0.5-2.00
ADDITIONAL INSTRUCTIONS: Apply when newly hatched larvae appear and before leaves are rolled. Continue applying as a part of the normal cover spray program until pest is adequately controlled. Apply when caterpillars are actively feeding (2nd-4th instars).	
<b>Avocados</b>	0.5-1.50
ADDITIONAL INSTRUCTIONS: Apply as necessary to maintain control. Begin treatment as soon as possible after hatching and before larvae are protected by leaf folds. ( <i>Amorbia [Mexican leafroller]</i> is suppressed only.)	
<b>Bananas</b>	0.5-1.50
ADDITIONAL INSTRUCTIONS: Hawaii only. Use calibrated ground equipment with adequate water to apply to point of runoff.	
<b>Citrus</b>	0.5-1.50
ADDITIONAL INSTRUCTIONS: Use 50-600 gallons of water per acre when using ground equipment and 10 gallons of water minimum per acre by air. ( <i>Amorbia [Mexican leafroller]</i> is suppressed only.)	
<b>Blueberries, Caneberries, Currants, Kiwi</b>	0.25-1.50
ADDITIONAL INSTRUCTIONS: Apply by ground equipment only. Begin treatment as soon as possible after hatching. For leafrollers, apply before larvae are protected by leaf folds.	
<b>Grapes</b>	0.5-1.50
ADDITIONAL INSTRUCTIONS: Start treating as soon as possible after hatching and before larvae are protected by leaf folds.	
<b>Almonds, Apricots, Cherries, Filberts, Nectarines, Peaches, Pecans, Persimmons, Pistachios, Plums, Pomegranate, Prunes, Walnuts</b>	0.5-2.00
ADDITIONAL INSTRUCTIONS: For leafrollers, start treating as soon as possible after hatching and before larvae are protected by leaf folds. Apply when caterpillars are actively feeding (2nd to 4th instar).	
Application timing is very important for good pecan nut casebearer suppression. Consult your local university or extension agent for information concerning specific modeling that predicts egg lay, typical application dates, and scouting techniques for your area. CoSTAR® must be present at egg hatch for best control. Make application when the majority of eggs are in the pink stage. For best control make two applications 7 days apart. If only one application is made, a minimum of 0.5 lb. should be applied.	
<b>Cotton</b>	
<b>Except Arizona and California</b>	
ADDITIONAL INSTRUCTIONS:	
<b><i>Helicoverpa zea</i> and <i>Heliiothis virescens</i></b>	
<b>Early Season</b>	0.25-1.50
Begin applications when at least 50% of plants are at pinhead square stage and <i>Helicoverpa zea</i> or <i>Heliiothis virescens</i> are present at damaging levels. If <i>Helicoverpa zea</i> is the predominant species or if worm populations are high, use a higher rate or tank mix with a labeled ovicide (see below).	
<b>Mid-Season</b>	0.25-1.50
Repeat as necessary throughout season to maintain control. Time application at peak egg hatch or 1st instar larvae. If egg laying is heavy and constant over a three-to-five day period, time application when eggs laid on the first day have developed into 2nd instar larvae. During periods of high temperature, worms will progress through 1st and 3rd instars very rapidly and early application timing is necessary for control. Continue applications as needed based on field scouting up to pyrethroid spray window.	

To be effective, CoSTAR® spray must be deposited at the larval feeding site. When plant cover is dense and worms are feeding in the lower 2/3 portion of the plant, aerial application of CoSTAR® may not provide adequate control.

For added control of *Helicoverpa zea* and *Heliiothis virescens*, tank mix CoSTAR® with a labeled ovicide, such as amitraz (0.125-0.25 lb a.i./acre), methomyl (0.125 lb a.i./acre), profenofos (0.25 lb a.i./acre), or thiodicarb (NOT FOR CALIFORNIA) (0.125 lb a.i./acre). For added control of pyrethroid resistant *Heliiothis virescens*, include CoSTAR® as a tank mix partner with pyrethroid applications.

***Spodoptera exigua*** 0.5-1.50  
Apply when *Spodoptera exigua* population densities are damaging. Time application when the majority of the worm population is in the egg-hatch to 3rd instar stage. If populations are dense, use higher rate.

To be effective, CoSTAR® spray must be deposited at the larval feeding site. When the plant canopy is dense, for best control tank mix CoSTAR® with a labeled larvicide, such as chlorpyrifos (0.25-1.0 lb a.i./acre), methomyl (0.33-0.75 lb a.i./acre), profenofos (0.5-1.0 lb a.i./acre), or thiodicarb (NOT FOR CALIFORNIA) (0.6-0.9).

## VEGETABLE CROPS

**Artichokes** 0.5-1.50

ADDITIONAL INSTRUCTIONS:  
For ground applications, apply in a minimum of 100 gal. of water per acre with a spray interval of 10 days or less.  
To aid in resistance management of the artichoke plume moth, apply 0.5 lb/A in combination with a pyrethroid by ground or air. Use and follow all label directions of the tank mix partner regarding application, timing, gallonage, and schedules.

**Asparagus, Beans (Green, Lima, Mung), Broccoli, Broccoli Raab (Rapini), Brussels Sprouts, Cabbage, Cardoon, Carrots, Cauliflower, Celery, Celery, Chick Peas, Chinese Broccoli, Chinese Cabbage, Collards, Cucumbers, Dry Bulb Onions, Eggplants, Garlic, Green Onions, Greens (Dandelion, Turnip, Mustard, Beet, China), Herbs (Basil, Cilantro, Dill, Oregano, Thyme, etc.), Horseradish, Kale, Kohl Rabi, Leeks, Lettuce (Endive, Romaine, Head Lettuce, Escarole, Butter Crunch, Leaf, etc.), Melons (Cantaloupe, Crenshaw, Honeydew, Muskmelon, Watermelon, etc.), Okra, Onions, Parsley, Parsnips, Peas, Peppers, Potatoes, Pumpkins, Radishes, Rutabaga, Salsify, Spinach, Squash (Summer and Winter), Sweet Corn, Sweet Potatoes, Swiss Chard, Table Beets, Tomatoes, Turnip Root, Watercress, Yams** 0.25-1.50

ADDITIONAL INSTRUCTIONS:  
Apply as necessary to maintain control.

## FIELD CROPS

**Alfalfa (Hay and Seed), Sudan Grass, Tobacco,** 0.25-1.50

**Hay Crops & Other Forage Crops**

ADDITIONAL INSTRUCTIONS:  
Under conditions of rapid plant growth and rapidly increasing armyworm populations (10 worms or greater per 180° sweep) use the highest rate. Use a contact insecticide in combination with CoSTAR® if 4th and 5th instars of multiple worm species are present in the crop and continuous egg laying is occurring. The addition of a spreader sticker to CoSTAR® may provide improved performance.

**Canola and Evening Primrose** 0.25-1.50

ADDITIONAL INSTRUCTIONS:  
Apply as necessary to maintain control.

**Dry Beans and Peas, Lentils, Mint,** 0.25-1.50

**Peanuts, Rice, Safflower, Soybeans  
Sugar Beets, Sunflower, Sorghum**

ADDITIONAL INSTRUCTIONS:  
Apply as necessary to maintain control.

**APPLICATION RATES (continued)**

CROPS	LBS./ACRE
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**Field Corn, Pop Corn, Seed Corn** 0.5-1.50  
 ADDITIONAL INSTRUCTIONS:  
 Make initial application when economically damaging population exist. Repeat as necessary to maintain control. Applications must be made to early instars prior to entering the ear or plant.

**Hops** 0.5-1.50  
 ADDITIONAL INSTRUCTIONS:  
 Begin treatment as soon as possible after hatching and before larvae are protected by lead folds.

**Melons** (Also see vegetables) 0.25-1.50  
 ADDITIONAL INSTRUCTIONS:  
 Apply at first sign of hatch before larvae enter fruit. Repeat as necessary to maintain control.

**Strawberries** 0.25-1.50  
 ADDITIONAL INSTRUCTIONS:  
 Apply as necessary to maintain control. In a tank mix with contact insecticides, use a minimum of 1/2 lb. of CoSTAR® for the control of armyworm.

**SHADE TREES and ORNAMENTALS (INCLUDING ROSES)** 0.25-1.50  
 ADDITIONAL INSTRUCTIONS:  
 Apply when leaf expansion reaches 40% to 50% as infestation warrants. If eggs hatch over a long period of time, or if reinfestation occurs, spray about 14 days after first application.  
 Apply when most larvae are 3rd – 4th instar. Also consider the opening of the bud cap to ensure foliage exposure. Apply after eggs have hatched and early instar larvae are feeding on exposed foliage.

**TURF AND GRASS SEED PRODUCTION** 0.50-1.50  
 ADDITIONAL INSTRUCTIONS:  
 Repeat as necessary throughout season to maintain control.

**STORED SOYBEANS, GRAINS (INDIAN MEAL MOTH, ALMOND MOTH)**  
 ADDITIONAL INSTRUCTIONS:  
 To control and prevent Indian Meal Moth and Almond Moth infestations of stored soybeans and grains, prepare a spray mixture which includes 1 gallon of water for every 1.5 oz. by weight of CoSTAR®. Apply spray mixture either by treating the top 4 inches of grain as it is being augered into storage (applying 0.6 pint of mixture per bushel in the grain stream), or by treating the surface of grain after it is in the bin. The Table below can be used as a guide in determining the total amount of CoSTAR® needed according to the bin diameter or the number of bushels to be treated.

Bin Diameter (ft.)	Surface Area (sq. ft.)	Bushels (to 4 in. depth)	CoSTAR® Rate (by weight)	
			Grams	Oz.
8	50	13	21	0.40
12	113	30	50	0.90
16	201	53	85	1.50
20	314	84	120	2.15
24	452	120	185	3.25
28	615	163	255	4.50
32	804	214	326	5.75

To insure thorough coverage when making applications to the grain surface after it is in the bin, apply spray mixture in three (3) applications. Mix the grain with a scoop or rake to a depth of four (4) inches after each application.

Treat stored grain anytime, but for best results, treat grain at the time it is placed into storage or shortly thereafter, or in the early spring prior to egg-laying. Full season control is normally experienced. Re-treat only if reinfestation occurs.

For the protection of bagged grain, apply spray mixture to entire grain mass, and mix thoroughly prior to bagging. CoSTAR® at 3 oz. by weight per 10 gallons of water will treat approximately 100 bushels.

Treated grain may be used at any time after treatment.

**FLOWERS AND ORNAMENTALS**

CoSTAR® may also be used on flowers and ornamentals outdoors and in the greenhouse at a rate of 0.25 – 1.50 lb. per 100 gallons of water for control of insects listed on this label.

**GUIDE FOR SMALL SPRAY VOLUME MIXING**

Rate Lbs./A	Conversion Rate* Teaspoons/Gallon
1/8	1/4
1/4	1/2
1/2	1

\*Assumes Application to spray runoff.

**STORAGE AND DISPOSAL**

Do not contaminate water, food, or feed by storage and disposal.

**Pesticide Storage:** Store in original container in a cool, dry place inaccessible to children and pets and away from heat and direct sunlight. Protect from freezing. Storage at temperatures above 90°F may impair effectiveness.

**Pesticide Disposal:** Pesticide, spray mixture, or rinse water that cannot be used according to label instruction must be disposed of according to Federal, State, or Local procedures.

**Container Handling:** Nonrefillable container. Do not reuse or refill this container. Completely empty bag into application equipment. Then offer for recycling if available or dispose of empty bag in a sanitary landfill, or by incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**WARRANTY**

CERTIS USA, L.L.C. warrants that the material contained herein conforms to the description on the label and is reasonably fit for the purposes referred to in the directions for use. Timing and method of application, weather, watering practices, nature of soil, the insect problem, condition of the crop, incompatibility with other chemicals not specifically recommended, and other influencing factors in the use of this product are beyond the control of the seller. Buyer assumes all risks of use, storage or handling of this material not in strict accordance with directions given herein. **NO OTHER EXPRESS OR IMPLIED WARRANTY OF THE FITNESS OR MERCHANTABILITY IS MADE.**