TECHNICAL BULLETIN

Control Solutions Inc.
PRODUCTION ANIMAL

USE PERMETHRIN™ CS TO CONTROL DARKLING BEETLES IN POULTRY BARNS

ECONOMIC, PERFORMANCE & BIOSECURITY IMPACT

Darkling beetles (also known as lesser mealworms or litter beetles) are the most important insect pest in broiler production. Left uncontrolled, these beetles can cause significant damage and economic loss:

- Destroy insulation and structural wood in broiler houses
- As much as 67% increase in energy costs
- Consume poultry feed
- Carry and transmit disease organisms and parasites
- *Salmonella*
- *Campylobacter*
- Newcastle disease virus
- 26 pathogenic types of *E.coli*
- In dry litter, larvae burrow into young chicks for water, & can kill younger birds

With today's current production practices, insecticide application is one of the more practical and effective ways to control darkling beetles.

WEAPON OF CHOICE: PERMETHRIN CS CONTROLLED RELEASE INSECTICIDE

ACTIVE INGREDIENT: PERMETHRIN 23.6%

Permethrin CS is a liquid microencapsulated concentrate containing 2 lbs of permethrin per gallon.

This product kills pests on contact but does not provide instant knockdown.

Permethrin CS is a broad spectrum insecticide, labeled for the control of over 75 pests, including:

- Ants (foraging Carpenter, Fire and Harvester ants; excluding Pharaoh)
- Cluster Flies
- Cockroaches
- Crickets
- Darkling Beetles
- Fleas
- Flies
- House flies
- Lesser Mealworms
- Mealworms
- Millipedes
- Mosquitoes
- Scorpions
- Silverfish
- Spiders (excluding Black Widow and Brown Recluse)
- Stable flies
- Ticks

RESISTANCE & INSECTICIDE ROTATION

Darkling beetles are becoming resistant to a number of different insecticides. A practical and effective way to manage insecticide resistance is to avoid using insecticides with the same mode of action (MoA) over and over again. Instead, alternate or "rotate" insecticides every 6 months. For example, if you've been using an organophosphate like Pyrofos CS, rotate to a pyrethroid such as **Permethrin CS** for the next 6 months, then rotate to another MoA class for the next 6 months, and so on.

OTHER INSECT PESTS

Permethrin CS may be used indoors and outdoors to control over 75 other pests, including those listed above. Use sites include Animal housing, Calf hutches, Calving pens and parlors, Empty chicken houses, Dairy areas, Hog barns, Horse barns and Milk rooms.

APPLICATION

Permethrin CS may be used on any surface which will not be damaged or stained by water. Heavy applications may leave a visible deposit on some surfaces. This deposit can be removed with a damp cloth or sponge. Thoroughly clean spray equipment before using this product. Shake the Permethrin CS concentrate well before diluting. When diluting, first add approximately ½ of the water to the spray tank and then add the proper amount of Permethrin CS. When emptying the bottles, triple rinse with water, shake well and add the rinsate to the spray tank. Add the rest of the water and agitate the sprayer thoroughly. Agitate sprayer occasionally during use to ensure even mixture. Shake or reagitate sprayer if spraying is interrupted or if dilution is left in sprayer overnight.

SPRAY DILUTION CHART

Permethrin CS Concentrate

AMOUNT OF FINISHED SPRAY	.05% SPRAY	.1.0% SPRAY
1 GALLON	2 2/3 FLUID OUNCES	5 1/3 FLUID OUNCES

Use the higher rate for clean-outs and high insect infestations.

Permethrin CS ▶

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PERMETHRIN CS APPLICATION OPTIONS

DARKLING BEETLE CONTROL
APPLICATION OPTIONS

Use **Permethrin CS** at of 5 1/3 fluid ounces (158 mL) /1,000 square of broiler house litter to be treated. Mix Permethrin CS with adequate water to ensure good spray coverage (for example, ½ - 2 gallons of water per 1,000 square feet of litter to be treated). Apply diluted Permethrin CS with low pressure spray equipment (tank or trigger sprayers). Two different application methods are commonly used for broiler houses.

WHOLE HOUSE TREATMENT

This method treats the entire floor area of the broiler house and lower portions of the walls.

Whole house treatment area calculations (example)

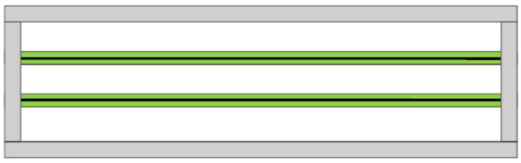
HOUSE DIMENSIONS

- Length = 500 ft.
- Width = 40 ft.
- **Floor Area** = 500 ft. X 40 ft. = **20,000 ft.2**
- Length of walls = (2 X 500 ft.) + (2 x 40 ft.) = 1,080 ft.
- Height to treat on walls = 1 ft.
- **Wall Area** to treat = 1,080 ft. X 1 ft. high = **1,080 ft.2**
- **Total Area to treat** = **20,000 ft.2** + **1,080 ft.2** = **21,080 ft.2**
- **Permethrin CS Needed:** 21,080 ft.2 X 5⅓fluid ounces/1,000 ft.2 = **112 fluid ounces (3,312 mL)**

CALCULATING MADE EASY!
Click or scan the QR Code to use our time-saving online calculator.

BAND TREATMENT

Band treatments apply insecticides to areas where darkling beetles tend to concentrate: along the walls and under the feed lines.



Band treatment area calculations (example)

HOUSE DIMENSIONS

- Length = 500 ft.
- Width = 40 ft.
- "Band" width = 3 ft.
- Number of Feed Lines = 2
- Length of walls = (2 X 500 ft.) + (2 x 40 ft.) = 1,080 ft.
- Area to treat along walls = 1,080 ft. X 3 ft. = 3,240 ft.2
- Area to treat under feed lines = 500 ft. X 3 ft. X 2 = 3,000 ft.2
- **Total Area to treat** = **3,240 ft.2** + **3,000 ft.2** = **6,240 ft.2**
- **Permethrin CS Needed:** 6,240 ft.^{2} X 5 1/3 fluid ounces/1,000 ft.^{2} = **33 fluid ounces (984 mL)**

CALCULATING MADE EASY!
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Applications should be made between flocks, after the litter in each house has been prepared for placement of the next flock (i.e., AFTER cake is removed, litter raked, and any new material added).