

TECHNICAL BULLETIN

USE TEKKO® 10 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: TEKKO 10 INSECT GROWTH REGULATOR CONCENTRATE

ACTIVE INGREDIENT: NOVALURON 9.3%

TEKKO 10 is a larvicide for the control of darkling beetles in poultry operations. Novaluron, the insect growth regulator (IGR) in TEKKO 10, prevents the immature stages (larvae) of these insects from developing into adult beetles, breaking their life cycle.

USE SITES

TEKKO 10 can be applied to poultry litter, animal manure and other insect breeding sites in and around the following areas:

- Poultry buildings
- Broiler houses
- Layer houses
- Refuse storage area
- Outdoor perimeter treatment

RESISTANCE & INSECTICIDE ROTATION

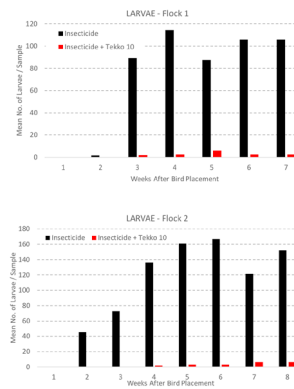
Darkling beetles are becoming resistant to a number of different insecticides. A practical and effective way to manage insecticide resistance is to avoid using insecticides with the same mode of action (MoA) over and over again. Instead, alternate or "rotate" insecticides every 6 months. For example, if you've been using a pyrethroid like Permethrin CS, rotate to an organophosphate such as Pyrofos 42 CS for the next 6 months, then rotate to another MoA class such as Dominion® 4L for the next 6 months, and so on.

RESISTANCE & INSECTICIDE ROTATION

The following charts show the results (and benefits!) of using an IGR like TEKKO 10 plus an adulticide for beetle control. These data are the results of a study conducted over two consecutive flocks on a commercial broiler farm. They compare the

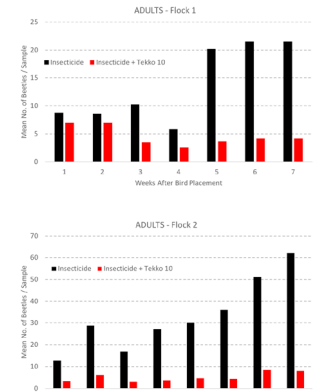
effectiveness of band applications of an adulticide alone (black bars) to a tank mix of this adulticide + TEKKO 10 (red bars) against both larval and adult darkling beetles. In the first two graphs, it's clear how the addition of TEKKO 10 dramatically improved larval control. This is what you'd expect from an IGR that prevents molting larvae from forming a new exoskeleton - they die!

Although IGR's like TEKKO 10 do not kill adult darkling beetles, tank mixing TEKKO 10 with an adulticide can be more effective against adults than the insecticide alone.



The second pair of graphs clearly show the indirect effect of TEKKO 10 on adult beetles. During weeks 1-4 of the first flock, adult beetle counts were similar for both treatments; however, in the final 3 weeks, the reduction in adult beetle emergence due to the TEKKO 10 in the combination treatment is easy to see. During the second flock, following retreatment of all the houses, adult beetle counts in the TEKKO 10 + insecticide houses remained

low, while they steadily increased in the insecticide only houses. By preventing the larvae from becoming adult beetles, the IGR showed a prolonged, lasting effect on adult beetle numbers.



Control Solutions, Inc., Study No. 17-233-1801; data on file. There were no untreated control houses in this study, because the grower did not want to leave any of his houses untreated for two consecutive flocks.



Livestock/Farm



Animals/Pets



Lawn & Garden



Residential

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TEKKO® 10 APPLICATION OPTIONS

DARKLING BEETLE CONTROL APPLICATION OPTIONS

Use **TEKKO 10** at a rate of 3 fluid ounces (90 mL) /1,000 square of broiler house litter to be treated. Mix Tekko 10 appropriate amount of Tekko 10 with ½ - 2 gallons water /1,000 square of litter to be treated Apply diluted Tekko 10 with low pressure spray equipment (tank or trigger sprayers). Two different application methods are commonly used for broiler houses.

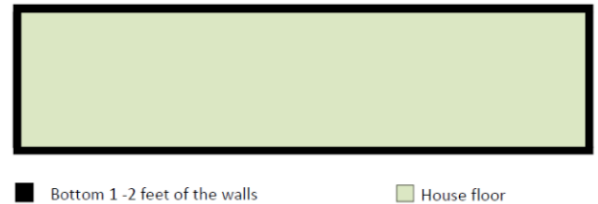
WHOLE HOUSE TREATMENT

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**
- **TEKKO 10 Needed:** 21,080 ft.2 X 3 fluid ounces /1,000 ft.2 = **63 fluid ounces (1,863 mL)**



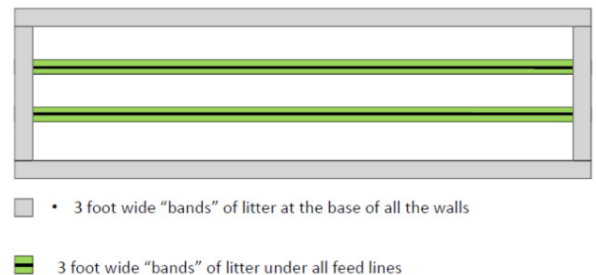
BAND TREATMENT

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**
- **TEKKO 10 Needed:** 6,240 ft.2 X 3 fluid ounces /1,000 ft.2 = **19 fluid ounces (562 mL)**



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).



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