

“Controlling Darkling Beetle Infestations in Chicken Houses”

UNIVERSITY OF
MARYLAND
EXTENSION



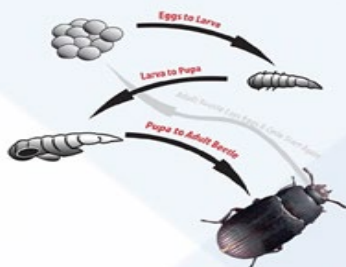
GROWER LUNCH BREAK NOTES MARCH 3, 2021

Jon Moyle introduced **Kimber Ward** of Elanco, Kimber.ward@elancoah.com, who began his presentation noting he would speak about Behavior, Control Practices, and Monitoring of Darkling Beetle (DB) Infestations. Management of litter in chicken houses includes darkling beetles.

To see the Kimber’s presentation and the questions/answers afterward, click on this link:

<https://umd.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=bb63453f-13c5-44cc-9eec-ace0012c73b2>

Darkling Beetle Behavior



- Behaviors affecting control efforts¹:
 - Congregate in specific areas
 - Burrow down in litter as an escape mechanism
 - Move deeper into litter in cold weather
 - Migrate from under feed line to side walls within 48 hours after bird removal
 - Nocturnal, but can be active at all times of the day
 - Do not fly unless required for survival
 - Beetles can fly about half a mile

Typically you’d find DB around feed lines, on the side walls. Familiarize yourself with this life cycle and what to look for.

On Delmarva a lot of the integrators hire applicators that may do a whole-house application down the side walls and handle all the licensing’s, permits, etc.

Pre-Flock Treatment

Spot Spray – application is concentrated directly under each feed pan

Banded – application where DB are more prone to live: feed lines, side walls, up side walls and brood chamber
Whole-house – application at feed lines and the remainder of the house; appropriate when populations are high

In-Flock Treatment

Darkling beetles are attracted to houses and congregate under feed lines due to the best conditions: food, heat, moisture. Brood chamber will have the highest populations.

We spray on top of the litter. Insecticides are contact killers so spray is on top and that’s where the beetles come to steal feed and make birds uncomfortable.

Control Programs – Application Methods

You’ll see the applicator personnel spray side walls, inside the empty house because when the chickens are out, the DB will disappear into the walls and burrow straight down into the floors. You’ve probably also seen truck applications where the whole house floors are sprayed.

- **Always follow label directions!** Most recommend using a low volume of water
- Consult with manufacturer to determine if any other products need to be added to stock solution
- **Never mix in a disinfectant**, this will lower the effectiveness of the insecticide

Management Control Practices

- Water – avoid excessive moisture in litter
- Feed – avoid spills/clean spills up immediately
- Litter – deep litter creates excellent conditions for DB to burrow, lay eggs, and hide from treatments
 - Clean out can help remove DB populations from houses

Keys to Success – Has to Be Done Successfully

- Follow label directions
- Application – poor application = poor results
- Avoid over dilution of product – use appropriate amounts of water per directions
- Banded treatment
- **Extra attention to the brooder chamber**

Darkling Beetle Control — Rotations

Chemical Class and Rotation	Neonicotinoid (2-3 flocks)	Pyrethroids (2-3 flocks)	Organophosphates (2-3 flocks)	Spinosyns (2-3 flocks)
Active Ingredients	Imidacloprid Thiamethoxam	Gama-Cyhalothrin Cyfluthrin Bifenthrin Permethrin	Chlorpyrifos Tetrachlorvinphos Dichlorvos	Spinosad
Common Brand Names	Agita [®] 10 WG Credo [®] CS Exile [®] DB Dominion [®] 4L MIDASH Forte	Permacap [®] CS Tempo [®] Permethrin SFR Tenguard [®] Optimate [®] Optashield [®] CS Bifen [®]	Durashield [®] CS Pyrofos [™] CS Rabon [®] Ravap [®]	Elector [®] PSP

Four classes of insecticides that applicator takes care of. Kimber cautions **not** to treat your own house on top of your applicator unless you talk with them so you are on the same page of what is being used. For example, there's only 4 products above, if you wearing out 2 of the same kind, then you only have 2 left. Ideally, you can have 6 mos. for each option and, by resting these treatments, not wear out sensitivity.

Phone App: IRAC Insect Resistance Action Committee

It lists the classes of products in rotation. Applicators should worry about this rotation for you, but stay informed!

What you can do:

Monitoring – Grade number of beetles 0-4 scale; check side wall, feed line, center of house, and brood chamber. Sensitivity testing can be performed to monitor for resistance.

- ❖ We want to treat early so chicks don't eat beetles or larvae and ingest insects that carry viruses.
- ❖ Integrators will protect the chicks, but we need beetle numbers low at placement to allow vaccines to work and not have chicks eat beetles, which are of no nutritional value, nothing to inhibit them from eating feed for growth
- ❖ Ingested beetles are detrimental earlier in chicks than later

Darkling Beetle Monitoring includes evaluating beetles in your houses at different times to gain an understanding of your control measures:

- At the end of the flock – this is the DB population that comes back when birds return
- Within a few days of placement – DB return when birds, heat, feed, and moisture are present
- 14 days in – this will evaluate current control measures of product used prior to placement
- 21 days in – determine if you need to do in-flock treatment for high beetle populations.

BEETLE POPULATION EVALUATION FORM: (Being sent from Elanco and will be available to download soon). This is useful information to give to applicator and/or integrator.

Windrowing - Don't leave a foot of litter on the side wall of the house, it creates a barrier for the insecticide and the bugs to reach each other – we want litter cleaned all the way to the side of the house, so when applicator sprays, he's putting insecticide on all litter.

Monitoring – Continual Process

- ❖ 100% control is not achievable
- ❖ Goal is to reduce the numbers of beetles in the house
- ❖ If starting with excessive numbers, you will gradually see a reduction in numbers in the center and side walls, higher numbers will be found under feed lines.
- ❖ **Early monitoring is important for obtaining control!** Populations will grow eventually as chickens are to move out

Kimber finished his presentation and the **Questions** began:

- **How far out before you get chicks can you treat for beetles?**
 - Usually there's a window of 5 – 7 days prior to chick placement that insecticides can go down. As growers, we put ammonia-control product on top of insecticide, that's not a problem. The problems comes when we mix ammonia or disinfectants with insecticides, which will neutralize the insecticide. Acidic water, not acid, insecticides do better with a water PH of 6 or 6.5
- **How does windrowing effect beetle numbers?**
 - 'I love windrowing for effecting beetle numbers.' If you heat your piles 130+ degrees, your adult beetles can escape that, but that temperature will kill eggs and some larvae and then use an adulticide you will IGR (Insect Growth Regulator) kill the pupa or worm stage, you'll kill multiple stages of the same bug and give you better control early.

- Do certain classes of insecticides suggested for certain seasons?
 - That's just a suggestion. We try to get 4 – 6 months out of each insecticide in a rotation. Keep records. Rotate rodenticides and rotate insecticides. Applicators should be doing that for you.
- Cicadas – this is the 17th year, will they be a problem in chicken houses?
 - The insecticide treatment over the years should make sure that's not a problem.
- What about a rotation program in breeder vs. broiler?
 - It takes longer for reduced sensitivity in breeders, longer for bugs to build up resistance in breeder houses, but absolutely would rotate to an organic phosphates at least every 3rd year or every other year in a breeder house.

'Insecticides all work around the nervous system on bugs and each insecticide group works on a different location of the bug. When you rotate a group, it changes where the insecticide targets the bug's nervous system. We are rotating on the inside where the insecticide works.'

- Is there a more effective application method, ie, backpack, pull behind sprayer, etc.
 - Applicators equipment is multiple tasked. Band applying may be a backpack sprayer or with a four wheeler or gator with spray nozzles directed to hit just sidewalls or under the feed lines. And their basically hitting 60% of your house. Then there's trucks that come in and cover entire floor area. There's no bad one or think is better than the other. It's getting complete coverage and covering with best, most sensitive active ingredient and getting that on top of the litter surface.
- Can I mix diesel with insecticide or only water?
 - I can't recommend you putting diesel down in your chicken houses. Use the label on your insecticide.
 - Jenny suggests reading your labels if you are putting insecticides down or even if you have someone do it for you, you should know what they should/shouldn't be doing, know what PPE (Personal Protective Equipment) they should be wearing, face mask, gloves, etc.
 - Jon suggests knowing how much time you need to leave it vacant, how long you should stay out
 - Kimber says applicator puts a tag on his house door with what was used. Your integrator and applicator should be able to tell you when you can go back in, what products were used, and what the safety is. He generally stays out 12 hours or if he has to go in, makes sure there's adequate ventilation and using PPEs. The label is important. The **IRAC app** will help you look at those labels as well.
- Any bugs eat beetles?
 - Nothing that Kimber is aware of in the chicken house, probably in the wild, but not in houses.
- Using an adjuvant with application is that important with insecticides?
 - PBU is a synthesizer for the insecticide or an IGR (Insect Growth Regulator) can be used to finish out the rotation if you are not seeing you the results you'd like. PBUs are meant to enhance the effectiveness or reaction of the chemical. Talk to your applicator/integrator.
- Long layouts – what can we do to control darkling beetles on a long layout if integrators aren't applying?
 - Long layouts are good for houses resting, in wintertime they don't reproduce as much. Best thing is if you take control and buying and put in your house yourself, again, figure out the last product used and if you have extended layouts, it gives you the ability to stay on an active ingredient longer because you're making fewer applications. Your sensitivities will last longer.
- Is boric acid effective? If so, how should it be applied?
 - Yes, it's in the IRAC active group. It kills by use of abrasion. I would band apply that directly beneath my feeders and down side walls is where boric acid is typically used. DE, diatomaceous earth, is another in that category that actually is an abrasive and dehydrates the bug. Don't do the whole floor, it's not necessary.

