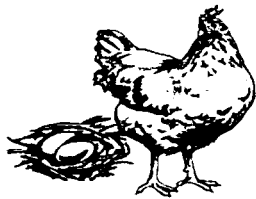


IPM Program For Turkey Grow Out Facilities

By
Maxcy P. Nolan, III, Ph.D.
NIPCAM

Coordinated Poultry IPM

Dr. Maxcy P. Nolan III

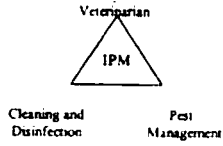


- A Program for Management of:
- 1. Insects
- 2. Rodents
- 3. Microbes
- 4. Environment

IPM

Integrated Pest Management

The Major IPM Concepts



Microorganisms
and
Macro Organisms

Microorganisms

- Transported by:
- Air
 - Water
 - Feed
 - Dust
 - Flies
 - Rats
 - People
 - Vehicles
 - Supplies
 - Equipment
 - Darkling Beetles
 - Fire Ants
 - Mice

Macro Organisms

Can Be Seen With The Naked Eye

Darkling Beetles

Flies

Rats

Mice

Mites

Fire Ants

Bed Bugs

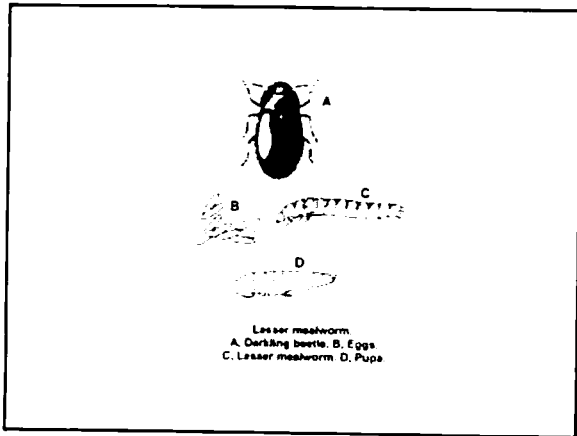
Lice

The most Common Insect Pest in Turkey Houses

- One insect species known as:
 - The darkling beetle
 - The black poultry beetle
 - The lesser mealworm
 - The scourge of poultry houses

Darkling Beetle Life Cycle

- Scientific name: *Alphitobius diaperinus*
- Egg - 4-7 days
- Larvae - up to 7 weeks
- Pupae - 7 to 11 days
- Adult - Up to 2 years





WHY DO I NEED TO MANAGE BEETLES IN A POULTRY HOUSE?

- Disease
- Damage to the houses
- Performance
- Processing plant
- Litigation

WHY ARE MY BEETLES SO BAD?

- Built Up Litter
- Tunnel Ventilation
- Dark Out
- Nipple Drinkers
- Larger Birds
- Litter Storage Sheds
- Solid Side Walls
- Cool Cell Pads
- Pesticide Resistance and misuse

Assessing the Beetle Population

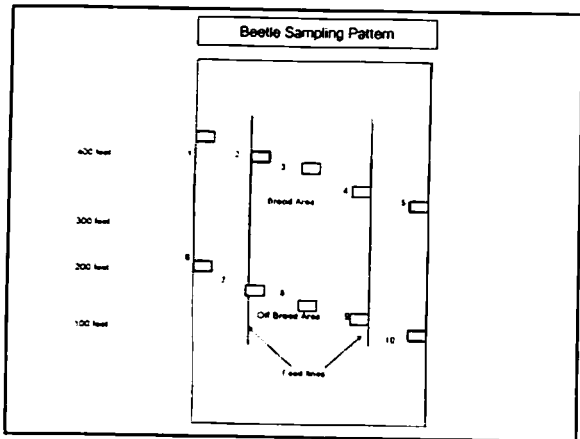
- BEETLE TRAPS
- INSPECT UNDER THE FEEDERS
- INSPECT ALONG THE OUTSIDE WALL
- INSPECT UNDER MIGRATING FENCES

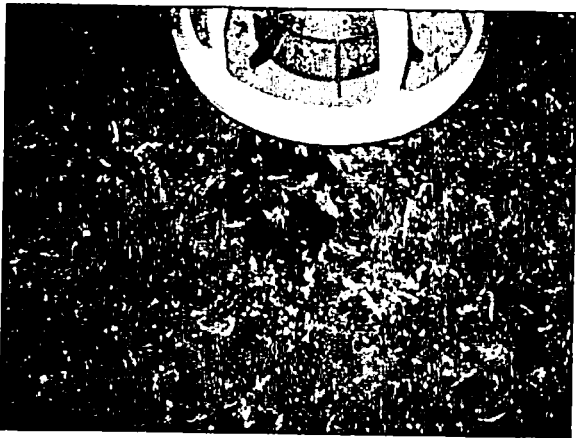
When to inspect

- At poult placement
- Third week of the grow-out
- Last week of the grow-out

HOW TO ASSESS THE POPULATION

- Low – 0 to 10 beetles seen
- Medium – 11 – 50 beetles
- High – 51 – too, too many to Count!!!





A successful Treatment should kill >95% of the adult beetle population.

- This may require litter treatment and removal prior to premise application.
- More than one Application between grow-outs.
- Treatment during the grow-out

WHEN TO TREAT

MULTIPLE TREATMENTS

- Right after depopulation
- Right after crusting
- As close as possible to bird placement
- During the grow-out

SINGLE TREATMENT

- As close as possible to bird placement

Correct treatment

- Reapply as needed means...
- Focus application areas. Floor treatment only is not enough.
 - At clean out always treat the floor
 - Residual on the side walls
- Correctly calculate treatment area not just floor area.

DO'S AND DON'T'S IN PESTICIDE APPLICATION

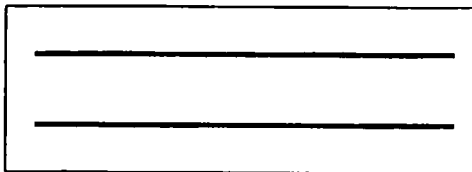
Turkey House Insecticide Treatment

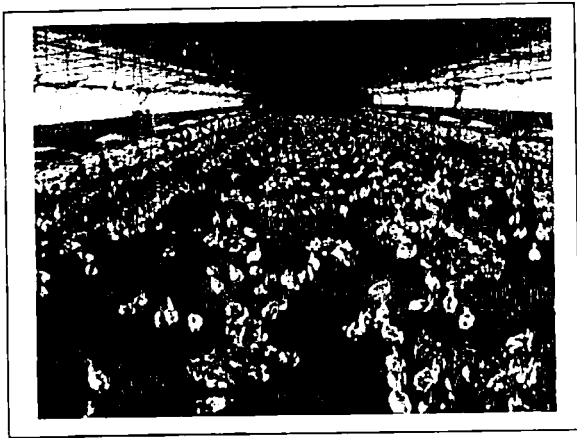
1. Treat using 1 gallon of water per 1,000 square feet of treated floor space.
2. For insecticide calculation, use the entire interior surface area of the house, for example, for a 500 x 400 foot house.
 - 500 x 40 foot house = 20,000 ft² of floor
 - (2) x 500 x 8 foot side walls = 8,000 ft² of side walls
 - (2) x 500 x 21.5 foot ceiling sections = 21,500 ft² of ceiling
 - [(2) x 50 x 8] - [7 x 50] end walls = 1,150 ft² of end walls
 - Total interior area = 50,650 ft²
3. Use Tempo SC Ultra, use 16 ml/1,000 ft². This would be 16 ml x 50 = 800 ml. Three bottles of Tempo = 720 ml
4. Therefore, use 720 ml Tempo SC Ultra in 50 gallons or less applied to the wall-floor junction and under the feed lines

Turkey House Insecticide Treatment Patterns

Spray along wall-floor junction and under feed lines

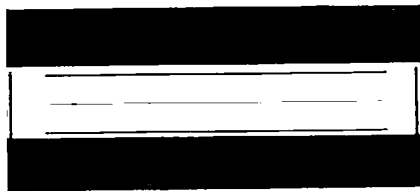
House with two feed lines

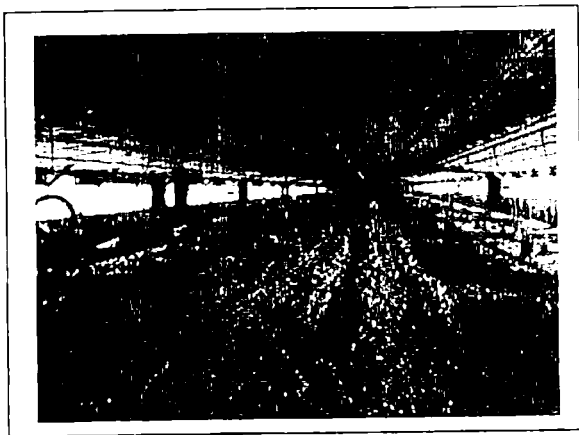




Turkey House Insecticide Treatment Patterns

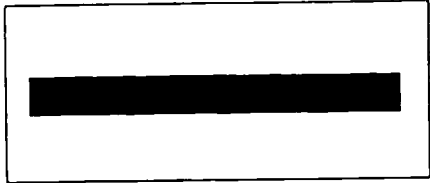
Treat from under side feed lines to wall in
Growout House with 3 Feed Lines and Chick Feeders





Turkey House Insecticide Treatment Patterns

Treat along wall-floor junction and 5 feet wide under Central Feeder Line in House with 1 Center Feed Line and side Water Lines





Do

- Follow the Label at all Times
- Use Appropriate Safety Equipment
- Use Appropriate Application Equipment
- Set up a Treatment Program to Follow
- Manage The Beetle Population

DO NOT mix insecticides with disinfectants.

- Insecticides are made and tested to be used ONLY as directed on the Label.
- Mixing with any other chemical may significantly reduce efficacy.
- You want your insecticide dollar to do the most for you, so don't do anything to reduce the effectiveness.

Prevent unnecessary loss of insecticidal activity at time of mixing.

- Virtually all insecticides are vulnerable to a phenomenon known as alkaline hydrolysis. That means they will breakdown quickly in environments where the pH > 7.0. A half life of 183 days at pH of 7.0 is reduced to less than 2 days at a pH of 9.0. This means your insecticide dollar will go much farther if you adjust the pH of your tank mixing water with an acidifying agent prior to adding your insecticide.

- Be sure the pH of your water is neutral or acidic (pH<7) for OP's and pyrethroids. Use pH>8 for Spinosad or Elected.
 - Always acidify or make basic the mixing water before adding insecticide (it can never hurt you)
 - Always triple rinse equipment when switching compounds
 - Always add active compounds after establishing correct pH.

- Make sure you mix your pesticide thoroughly
- Make sure the pesticide stays in solution
- Use citric acid to lower pH and sudsy ammonia to raise it.

USE THE RIGHT EQUIPMENT FOR THE JOB

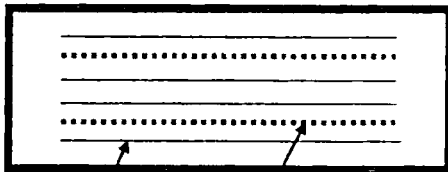
- Nozzles
- Tank
- Pumps
- Blowers
- Even Application

Dilution Rate and Efficacy-

- If using a soluble concentrate or wettable powder DO NOT use too much water.
- Use only enough water to apply the insecticide to the area being treated and getting the correct amount of A.I. on the areas being treated.
- Do not use more than 20 gallons of water per 20,000 sq. ft. Dilution rate and concentration matter.
- If using a WP, be sure to keep the mix continuously agitated during application to maintain a uniform concentration.

LIQUID POULTRY HOUSE INSECTICIDE TREATMENTS

Spray red areas about 3 feet wide; Use 8-004 and 8-008 nozzles; Use 1 gallon of spray per 1,000 ft² of floor area



Other factors affecting control and application rates.

- The more litter there is, the more area for beetles to hide and the more A.I. is needed to kill them.
- If the litter will be stored or applied to land close to the farm, it will need to be treated prior to removal to kill as many beetles as possible and minimize migration back to Poultry house

The Rotation Question

- Rotations are only true rotations if they involve an insecticide class change.
- An example here is that Tempo®, Optishield®, Valorshield®, Commodore® and Demand® are all different insecticide trade names. However, they are all within the same insecticide class of synthetic pyrethroids. None will serve as an adequate rotation for any of the others. A true rotation is from a synthetic pyrethroid to an organophosphate, carbamate or another compound outside of the synthetic pyrethroid class.

- Rotating to a new class with equal or poorer performance may indeed give you the break you need to recover efficacy of the class you were using.
- Never mix active compounds.

Class Comparisons

Chemical Class	Toxicity to mammals/ people	Insecticide potency	Residual Activity
Pyrethroid	Low	Hi	Hi
Organophosphate	Low to Very High	Med	Low
Extinosad	Low	Hi	Hi

Pyrethroids

- Tempo
- StandGuard
- Demand
- Annihilator
- Permethrin (various labels)

Organophosphate

- Rabon (Rabon, Beetle Shield)
- Ravap
- Dursban (Durashield, Duratrol)

Carbamates

- None Currently Labeled

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New and Reintroduced Insecticides

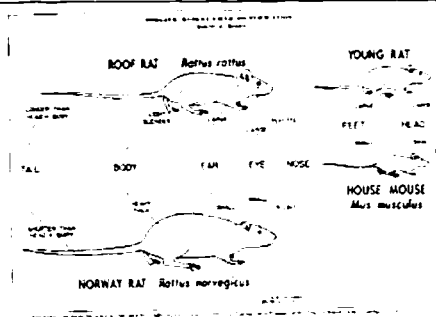
- Boric acid – acts both as a stomach poison and a contact desiccant (drying agent)
- Elector PSP – Extinosad, Spinosyn A and B
- StandGuard –Gamma-Cyhalothrin
- Tenguard–Permethrin

Application Rates for a 20,000 sq. ft. Broiler House

- Durashield – 120 ounces
- Boric Acid – 400 pounds
- Duratrol – 80 ounces
- Elector PSP – 8-16 ounces
- Tempo 1% Dust – 30 pounds
- Tempo 20 WP – 2 Jars
- Tempo SC Ultra – 3 bottles
- Rabon 50WP – up to 12 pounds
- Standguard – 24 ounces

Controlling Rodents in Poultry Houses

Know your rodent pests



RODENT IPM

- RODENT INSPECTIONS
- SANITATION
- RODENTPROOFING
- RODENT CONTROL

RODENT INSPECTIONS

- DROPPINGS
- TRACKS
- GNAWING
- BURROWS
- RUNWAYS
- GREASE MARKS
- URINE STAINS
- RODENT SIGHTINGS
- RODENT SOUNDS
- RODENT ODORS

BURROWS

- VERY CHARACTERISTIC OF RAT ACTIVITY
- USUALLY EASY TO SEE IF VEGETATION IS KEPT IN CHECK
- PROVIDE PROTECTION
- USED FOR SHELTER, RAISING YOUNG, STORING FOOD, ETC.

Rodent Burrows



DROPPINGS

- MICE
 - 50 TO 100/DAY
 - 1/8 TO 1/4 INCH LONG
 - POINTED ENDS
 - BROWN RICE

DROPPINGS

- RATS
 - 25 TO 50/DAY
 - 1/2 TO 1 INCH LONG
 - ONE END BLUNT
 - SHINY BLACK

GNAWING

- ONE PAIR OF INCISOR TEETH
- INCISOR TEETH GROW 0.3-0.4 mm/day
- (64 to 85 days/inch)
- GRIND TEETH
- GNAW WOOD, CONCRETE, ETC.

SANITATION

- FOOD
- SHELTER
- TRASH
- VEGETATION

RODENTPROOFING

- MICE (CAN TRAVEL THROUGH 3/8 INCH HOLE (1/4 INCH MATERIALS USED)
- RATPROOFING MATERIALS (USE 1/2 INCH MATERIALS)
- SHEETMETAL (26 GAUGE)
- HARDWARE CLOTH (1/4 INCH OPENINGS)
- BAND OF METAL OR GLOSSY PAINT (12 INCHES OR WIDER)

Carbamates

- None Currently Labeled

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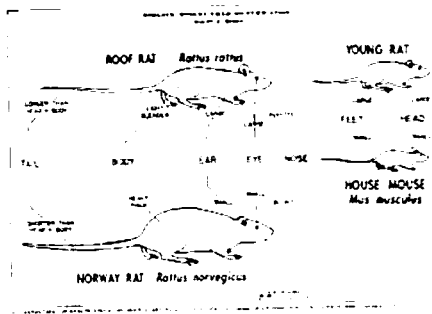
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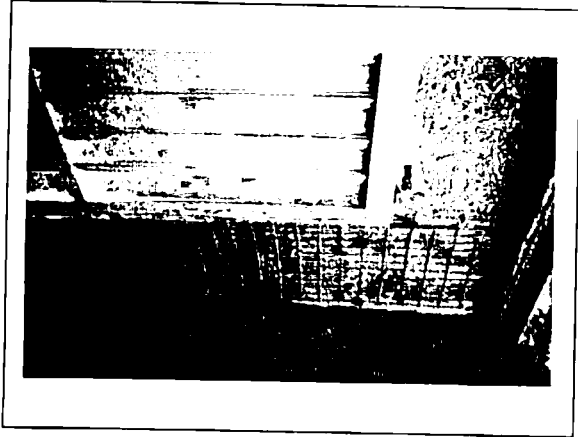
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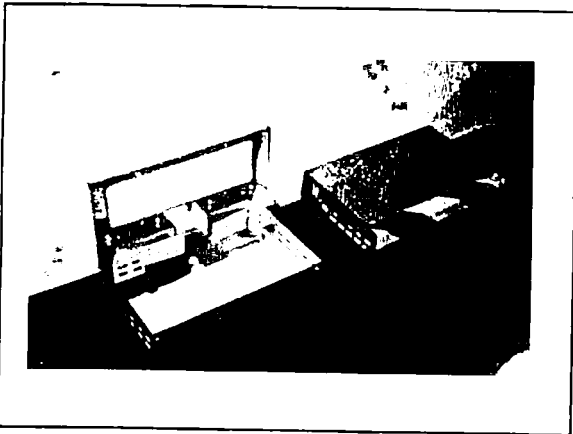
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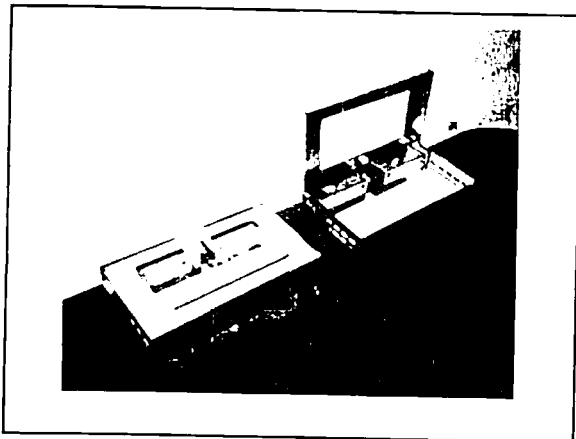
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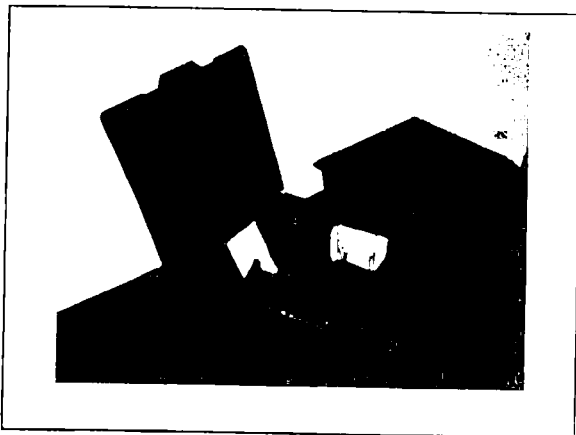
- TRAPPING
- RODENTICIDES
 - Bait stations
 - Bait in burrows
 - Loose bait





Rodent Control:

Are properly-designed exterior pest control stations present in adequate numbers and correct locations?



Rodent Bait Station Placement for Turkeys

- One bait station every 100 feet on the side and
- one on each side of the end door's outside

