

Pest Prevention and Monitoring



ONE FOCUS

Food Industry Pest Management

Every facility is a little different

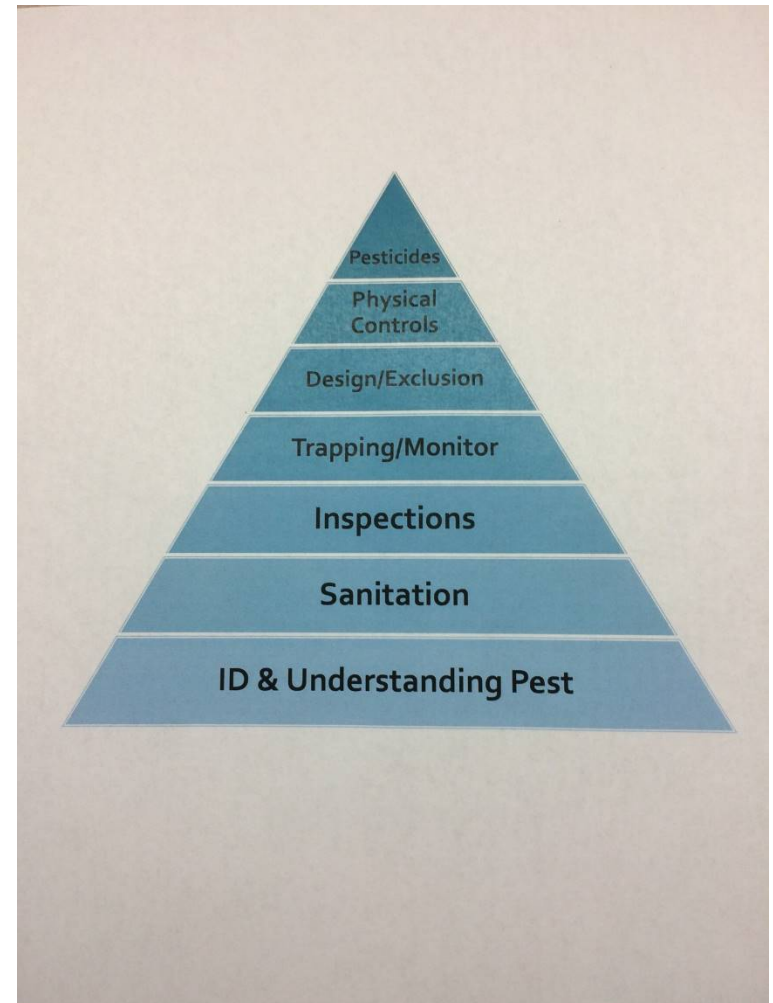


- All food facilities are vulnerable to rodents and “incidental invader” insects
- Dry process facilities are especially vulnerable to infestation by “stored product insects”
- Wet process facilities may have more threats from roaches or flies than others



Integrated Pest Management Pyramid

- Built on a foundation of pest biology and sanitation
- Inspections, traps, monitoring activity, exclusion, and other non-chemical tools
- Pesticides should be a last resort and smallest component



Integrated Pest Management (IPM)

- ❑ Utilizes properties of the pest's biology to use it against them
- ❑ 3 main targets
 - ❑ Food
 - ❑ Water
 - ❑ Harborage
- ❑ Needs differ by
 - ❑ each pest species
 - ❑ life stage

Sanitation

- VERY important part of IPM
- Helps disrupt:
 - ▣ life cycle
 - ▣ Harborage
 - ▣ cleans out food/water sources
 - ▣ Minimizes hiding places
- Allows for better/more thorough inspections
- Reduces inspection time

Pest Monitoring

- Bait stations
- Pheromones
- Traps
- Mating disruption
- Gels

Pheromones

- Have come a long way in development
- Original products were usually only 1-2 compounds
- Today many compounds closer mimic real-life mating pheromone complexes
- Matrixes are more complex
 - ▣ Rubber plugs
 - ▣ Fiber plugs
 - ▣ Infused strips
 - ▣ Slow release vials
- In combination with food baits
- Research is identifying more pheromones we can utilize (not just mating/feeding, but other behavioral attributes)

Bait Stations

□ Function

- ▣ Trap insects to monitor numbers
- ▣ Indicator of populations present
- ▣ Pull numbers out of general population
- ▣ Crawling insects focus

□ Bait Types

- ▣ Dry, liquid, or gel
- ▣ Pheromone, kairomone (benefits receiver), food



Mating Disruption



- Reduces populations
- Confuses males so they cannot find females
- Should be used with a pheromone monitoring program (before, during, and after)
- Know the size of your treatment area
 - ▣ Make sure you have enough disruption pheromone to properly saturate the area
- Space dispensers at a height of 5' to 16'
 - ▣ Each site will be different (bins vs warehouses)

Newer Research in Mating Disruption

- In development and testing
- Sprayable pheromones
- No need to hang/retrieve/replace pheromone infused strips
- Apply wherever needed
- Currently testing in pet stores
- Working on EPA registration
 - ▣ some hang-up with compound numbers

Gel Baits

- Several different active ingredients
- Most are labeled for cockroach control
- Newer baits have dual active ingredients or reformulated actives to enhance performance
- Maxforce FC Magnum is also labeled for stored product insects
- Active ingredient is Fipronil 0.05%



Maxforce[®]
FC MAGNUM



Lab SPI Experiment

- Only 2 reps of the experiments in the lab have been completed.
- 6 species tested: Warehouse beetle, Larger cabinet beetle, Red Flour beetle, Confused Flour beetle, Cigarette beetle, and Sawtoothed Grain beetle.
- 0.017 gram MaxForce FC Magnum used (about 1/4" bait).
- Insects placed on petri dishes 24 hours after bait placed.

Lab Overview Results

- After 24 hours Confused Flour Beetle and Sawtoothed Grain Beetle are most affected.
- By days 3 RFB and CFB are highly affected to near death (appear dead but have twitching legs and antennae, still occurs at day 4).
- Moderate death after 4 days occurred in WB and LCB.
- After 4 days Cigarette beetle are least affected.
- For many insects species, signs of being affected appear by day 1 or 2, and appear dead to the naked eye.
 - Many movements still going on day 3 or 4 are minute and can only be seen under a microscope.

SPI Baiting

- IFC has been working with this primarily in one California territory
- Goal is to reduce fumigations
- Labor intensive
- Must be followed strictly to be effective
- Must have a comprehensive IPM program in place

Factors to Success in SPI Baiting

- ❑ Intense deep cleaning program prior to treatment
- ❑ Initial Vapona/IGR fogging
- ❑ Dense applications of bait material throughout
 - ▣ Approx. every 5' to 6'
 - ▣ Around equipment, walls, etc.
- ❑ Use in combination with pheromone/bait trap program and IGR treatments for all pests (cockroaches, etc.)
- ❑ Must be done systematically
- ❑ For larger mills/facilities usually one floor at a time due to labor/time requirements

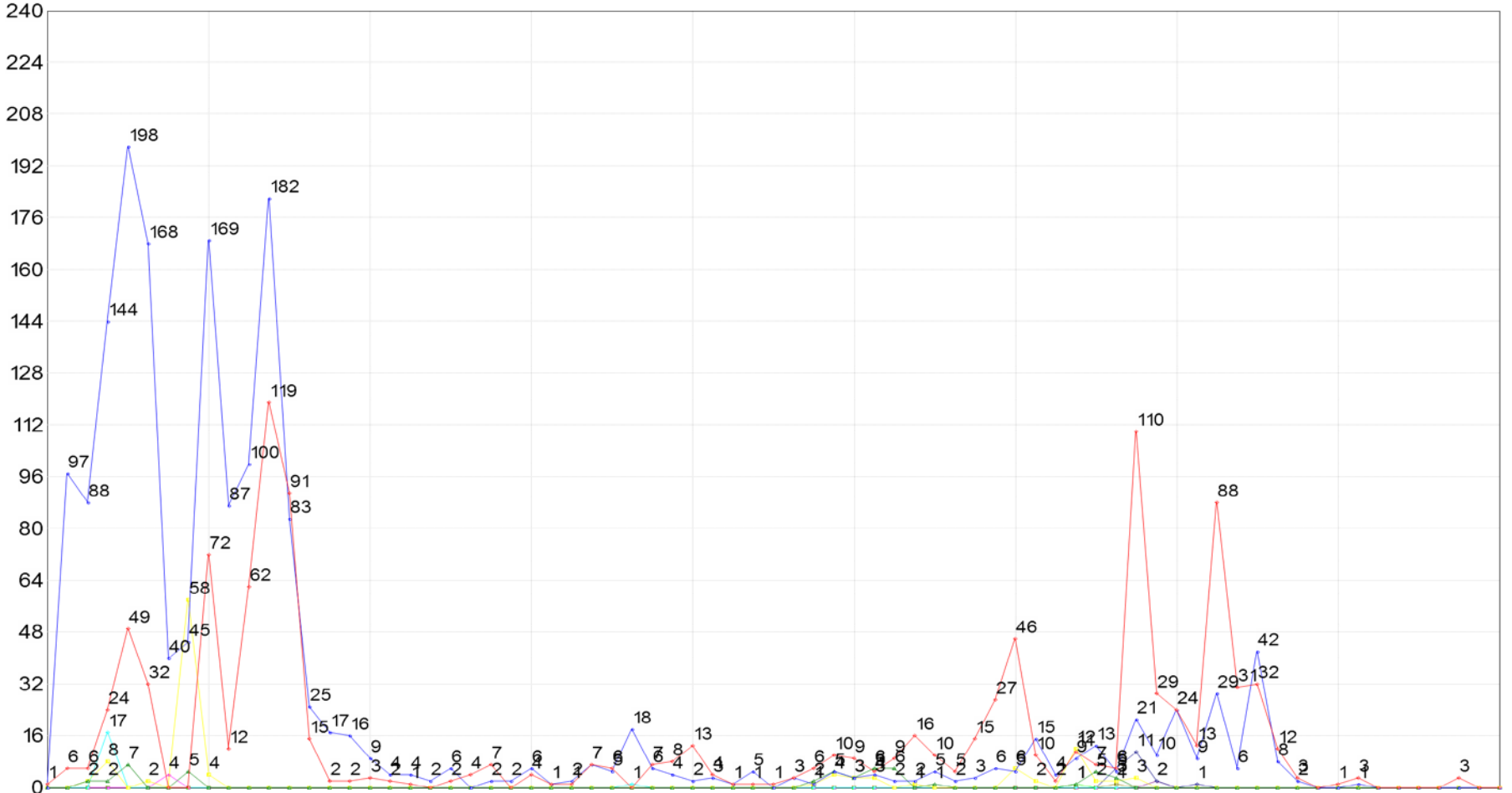


Rice Mill



Pest Trend 08/06/2015 To 02/06/2017

- ◆ Indian Meal Moth
- Flour Beetle
- ▲ Warehouse Beetle
- Cigarette Beetle
- ◆ Flour Beetle Larvae
- Fungus Beetle
- ▲ Unidentified Species
- Granary Weevil
- ◆ Sawtooth Grain Beetle
- Occasional Invader



Rice Mill Results

- Conventional & organic facility
- Had a grain operation to the north of it
- Had regular infestations introduced through organic grain
- Before bait treatment: fogging every 2 weeks for 7-8 months/year
- After just over a year: far less vaponal foggings conducted, almost zero customer complaints

Field SPI Baiting Program Attributes

- ❑ Allows regular treatments without interruption of production/work schedules
- ❑ No offensive odors
- ❑ Program is a continuous cycle (finish one cycle, start the next)
- ❑ Diacon IGR foggings should be performed every 8 weeks with this
- ❑ Continuous sanitation and improvements are critical
- ❑ Requires regular inspection/sanitation of all product storage and delivery systems to identify places of build-up (food and harborage)

IPM Conclusions

- IPM is a comprehensive program
- Combines many techniques to help reduce pesticide use
- Focuses on pest life cycles and disruptions
- Considers each species and may have different tactics depending on species and life stage
- Whole facility approach required, partial areas may just allow pests to move from one area to another

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Thank you for your attention!

Any Questions?