“Before he dies, every man should dig a well, father a son and plant a tree.”

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Jim Koan
Almar Orchards in Flushing, MI consists of 170 acres of certified organic and another 80 acres that are in transition.
- 10 years ago, started organic transition and told certifier that “I was never doing more than 20 acres.”
- Certified 20 acres for economic reasons and now have certified the other 230 because I am a “sustainable farmer,” and I don’t have to preach to the choir.
- We, in organic production, are pioneers – venturing into new lands, farming techniques, business models and new challenges. We are bringing with us, old tools that need to be reengineered, both physically and mentally.

- I’ve moved from a 20 year experience of growing conventional apples at a high volume, low profit scenario into a model of more diversification of organic agricultural production.
  
  - Down-sized wholesale and promoted year-round retail
  - Farm entertainment with U-pick apples and pumpkins
  - Growing for processing market
  - More focus on fresh cider (huge potential)
  - Hard cider with sales off the farm (don’t go there)
  - Pork and other meats are my next focus (animals back on the farm)
I have been invited here to talk about insect control. It needs noting up front that there is no one successful model that fits any two farms that I have seen in my 35 years of farming.

- It boils down to what you like to do, and what tools you have to do it with.

- What I have to say, works for me ... but it may not work for you.
My wife and I had a dream that started 35 years ago ... at least I did, and she came along. I wanted to spend my life on a farm and raise some children that would go out in this world and be “givers,” not “takers.” I think that at this plateau in our life, we can say that we have reached our goal and are beginning to reap the rewards of what we have sown.

I was reminded of this dream four years ago on my first visit to M.O.S.E.S.
Organic Apple Pest Insect Control “101”

- 1st Lesson – There isn’t a “101.” It isn’t that easy.
  - This doesn’t come as a surprise for anyone here that is attempting it.

- It is possible to raise organic apples but timing of control inputs is critical and complete coverage is of the utmost importance.

- Remember that insect pest control is only one small part of the success equation. I could spend even more time on:
  - Methods of soil fertility
  - Disease control
  - Apple cultivar personalities
  - Orchard planting strategies
  - Maintenance strategies
  - And so on and so forth...
Back to the Bugs ...

This is kind of like the movie, “Back to the Future,” with Michael J. Fox, where you “go back in time” to change where you want to be in the present. Wouldn’t that make our job easier?

- We farmers all have 20/20 hindsight and we don’t have good foresight.

- We fix our mistakes and move on and prepare for the next season.

- If we could use foresight instead of hindsight, we might not be in the farming business.
Back to the Bugs ... (Minor pests)

I have lots of minor pests because of my border habitats:

- 3 woods and several meadows
- Misteguay Creek cuts diagonally through my farm
- 100 acres of poorly managed conventional orchard, just west of mine
  ✓ My cousin claims that his pest problems come from my “organic horticultural practices.”

These three types of border habitats may actually be beneficial – and not a nuisance.
Minor Pests

- Red Banded Leaf Roller
- Oblique Banded Leaf Roller
- Spotted Tentiform Leaf Minor
- Tarnished Plant Bug
- Rosy Apple Aphids
- European Red Mite
- Green Apple Aphid
- Green Fruit Tree Worm
- Dogwood Borer

If you don’t recognize and have a mental image of each of these, then you have a problem.

Every one of these guys is a “terrorist,” ready to inflict damage ... especially if you are using conventional growing practices.
Minor Pests

None of the minor pests cause economic damage under organic practices.

- Beneficials will control all of these. If you don’t have control, then you are doing something wrong and hurting beneficials.

  - For example, flared red mites due to overuse of sulfur in attempting to control apple scab.
Major Pests

These are my enemies – the ones that most of my focus, costs and energies are used to battle.

- Plum curcilio
- Codling Moth
- Apple Maggot

My organic tools for battling these pests were neem, aloe, diatomaceous earth, garlic, molasses, fish, and four or five other concoctions ... including “throwing the kitchen sink at them.” One by one, I have thrown almost every one of these tools away and have settled on a more simple, clean program that seems to work for me. I think that it is the cheapest and best for the return on my investment on my 120 acres of apples. Other strategies will work for smaller blocks.
Plum Curculio

First line of defense is perimeter lures and traps.

- Watch weather forecast for temps greater than 70°F because that is when she gets active.
Second line of defense is Surround and garlic.

- First cover of surround with garlic and DE at 80% petal fall.
  - 100 gallons of water/acre and 50 lbs. of surround

- Second cover at 35-50 lbs., 3-4 days later.

- Keep covered at 25 lbs./acre and freshen up every 7-10 days with garlic and DE. Recoad if temperature is predicted to be > 70°F.

  - With high winds or 0.5” rain, you will lose most of your protection and you will have to recover.

- Surround eliminates some “foreplay,” but you will get a flush of over-positioning at the end of the egg-laying cycle.
Third line of defense is elimination of June drop apples, either manually or with animal grazing.
Manually
Pigs Grazing on June Drop Apples
Guineas Gorging Themselves on PC Before Retiring to Their Condo
Don’t Pick Off Injured Fruit and Leave in the Orchard!

- Normally, we get 5% thinning effect and 5% more stays on the trees and gets harvested (around the perimeter), while 0.01% is damaged inside the orchard.

- PC love Lodi and Liberty varieties.
Battling Codling Moth

About 2-3 weeks after the PC are all done “beating you up,” codling moths’ eggs start hatching.

- You must biofix for your orchard and also have a trap for each 2-3 acres for monitoring population thresholds.
First line of defense is pheromone disruption.

- I’ve used C++ at 400 ties/acre for years with excellent results.
  - 500 ties on the outside and 250 ties on the inside
  - Tie placement is critical – position correctly in canopy
  - No holes allowed
  - There’s a learning curve involved here ...
Second line of defense is to recover with Surround 1-3 times at 25 lbs./acre.

- Helps only about 20%
Third line of defense is to use virus sprays.

- This is a **must** in first generation – Do not ever skip this!

- Cydx at 2 oz./acre every 6 days when trap catch is above threshold and 250 degree days base 50 have progressed
  - You must know the weather for the week of that trap catch when it is above threshold
    - Moths fly only at dusk with no wind or rain and above 60°F.

  - Complete coverage is essential so larvae eat virus as they eat their way out of the egg
    - It takes 2 days before they get a bellyache and stop eating

  - Cold, rainy weather will cause high larvae mortality

- You need to get first generation larvae down to < 1% survival to control 2nd generation by pheromone only

- You need to have apple fruit set down to singles for better coverage
You can put a cardboard band around the trunk and capture the pupating first generation and then pull it off the tree and burn it in late July in order to control the second generation.
Battling the Third Bad Bug – Apple Maggot

- Fly emergence usually occurs in mid to late July
  
  - Heavy rain brings it out of the ground and it eats for 8-10 days, then mates and starts laying eggs in the apples
  
  - Can pupate in the ground for 2-3 years under drought-like conditions

- First line of defense is to set traps every 15-20 ft. at head height around perimeter of the orchard
Second line of defense is to spray GF120 fly bait near the cups

- A few drops every 7-10 days in the hot spots where you are catching 2-3 flies on a single trap

Third line of defense is to apply Surround

- Has never been necessary for me
Word of Caution: ERM Might Be Flaring in Late July!

- If you used too much sulfur (like I often do), you’ll have flaring and need to quickly bring it under control now or pay later.
  
  - Oil spray at 1% and usually 100 gallons of water/acre to control eggs and juvenile mites of ERM
  
  - If you don’t control now, they will get out of hand in August – you must be proactive!
  
  - Don’t spray when temps. are >80°F.
  
  - Must have complete coverage to totally encapsulate egg with oil.
Battling Second Generation Codling Moth is Usually Just Skirmishes!

- Biofix is usually in early August
- Check all traps once/week for any thresholds above 5
  - Above threshold, you’ll need to apply 1% oil every 220 degree days base 50 for each event
  - Catches above threshold will change from orchard to orchard and week to week
  - These hot spots are created by poor tie placement and/or good trap placement
Michigan Usually Doesn’t Have a Complete Third Generation of Codling Moth

- If you do, then you have to go with a more expensive program

  - A mix of Entrust and Virus in the second generation to control the third generation

(Photo courtesy of my non-organic neighbor)
Questions?

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