

## Maury Wills vs. apple pests

by Sally Worley

**Wills Family Orchard is situated outside of Adel in picturesque rolling hills that overlook the Raccoon River Valley. Maury and Mary Wills planted their first apple tree in 1992. Maury is a city kid from the south side of Des Moines. His dad grew up on a fruit farm near Cambridge and that resonated with Maury. Mary grew up on a small dairy farm near Ames and envisioned a farm upbringing for her children as well.**

Maury was rooted in the organic lifestyle before the orchard was born: “I was buying organic food. I lived in Columbia, MO, for a time and used to go to the food coop and had read all the books of the time pertaining to whole foods. I thought, if I’m going to raise apples, I’m going to learn how to grow them organically because it’s going to be a learning curve for me anyway.”

Maury plunged himself into researching apple growing techniques used prior to World War II and the advent of many modern farm chemicals, including organophosphates. “I wanted to find out how the old timers did it, so I looked at as many old resources as I could find,” he mused. Maury was a big fan of *Mother Earth News* and searched every page of stacks of the publications for stories of orchardists.

“This was 1991. I came across an article from 1980 about A.P. Thomson, an apple grower in Shenandoah Valley. A.P. grew up in the orchard, went to World War II, returned and decided to revamp his orchard into an organic operation. This really sparked my interest for raising apples organically – I found a face and name of someone doing it.”

Maury found inspiration from A.P. Thomson, but realized his farm in Iowa presented a different playing field: “We’re in the Midwest. We have different humidity, different insects,



**Maury Wills points out his apple sprayer.**

and different temperatures from other parts of the country.”

Wills Family Orchard has been certified organic since 2000. Maury doesn’t let the fact that his apples are certified organic justify a lesser quality product. “We market a good graded apple. Having an awful apple and saying they’re organic is no excuse as far as I’m concerned. If you do something organic and there’s no quality about it, what’s the use?”

There are four acres of apples in the orchard, and Maury wants to increase to 10 acres over time. He started with scab immune varieties and continues to experiment with new varieties that will work well in an organic orchard: “I put in 80 Honeycrisp, but am pulling them out. They are all dead.” He is seeing good results with other varieties that aren’t immune to scab, such as Spartan, Chieftan and Macoun.

Wills Family Orchard raises pumpkins, winter squash and gourds but not organically. “This year we’ve used three treatments, fewer than typically used in the conventional world. Right now that’s the only way we could have a crop. We don’t use any herbicides, just

insecticides for cucumber beetle and squash bug.”

“Every year we make an improvement on the farm. We used to do everything out of the house but built our store building three years ago,” Maury said. The store houses a custom-built apple washer, retail area and apple storage. Maury and Mary have a certified kitchen in the basement of their home but plan to move the kitchen to the store building as well as build a fully plumbed bathroom in the store.

The store sells value-added products they make, including organic apple butter, applesauce and pies. They also host tours from school groups. Business on the weekends during the fall has really picked up. Maury says, “When we started selling from the farm, we were excited if we had two or three or four customers. One weekend we had eight people drive in and that was exciting. Yesterday we had hundreds, and it was awesome.”

Maury applies organic controls to the orchard with a 50-gallon, John Bean air blast PTO orchard sprayer. He can combine many of the treatments in the tank, reducing application labor. “The sprayer has nozzles and a huge fan on the back. Water comes out in narrow streams, hits the air blast area and makes fine particulate spray. It provides good coverage and is a great sprayer for us.”

Before they owned the air blast sprayer, Maury applied his products with a barrel and 1/2-horse, on-demand pump with hose and spray wand. “It was a really cheap, good way to get started. As you grow, at some point, you have to get the right trade off for time with a bigger sprayer.”

## Wills' family orchard Organic apple-pest control methods

by Sally Worley

**Growing an organic apple is not easy, especially in Iowa. Over the years Maury has improved his pest control regime. "I was really green when I started. Plus, drastic improvements have been made in organic products available for apple producers." Maury's spray regime continuously evolves.**

### Quince Rust

Very early in the season, Maury starts his pest control with an application of biofungicide, Serenade, bacillus subtilis. This controls quince rust. "If infected by quince rust, the blossom end of the apple stays real narrow and shrivels, and the rest of the apple grows. If you cut into the apple, you see dark circles, and they taste awful," Maury says. Serenade is sprayed into the flower cup before the arrival of quince rust spores and occupies the sights that quince rust would occupy. "It really does work," he adds.



### Green Fruitworm

"The first insect that really is a pest for us is green fruitworm. In early spring, when the apples are set on the tree and are pea-sized, they'll start to eat the side of the apple away. The apple's history if that happens." Green fruitworms arrive dependably every spring, and the Wills' family begins scouting for the worms once the fruit are set. When they find green fruitworm, they spray bacillus thuringiensis, or Bt. Often kelp or fish emulsion will be added to the first Bt spray for fertility. After the initial application, Maury applies Bt in every cover spray after that without scouting. Spray interval is about every week from petal fall through about late June.



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### Codling Moth

"Five or six years ago codling moths were really tearing me apart," says Maury. Codling moth larva tunnels through the core of the apple, leaving frass in its path. While Maury was struggling with codling moth, Dow developed a product called spinosad, formulated for organic apple growers. Maury tried a sample and his codling moth damage went from 70% to 5% the next year.



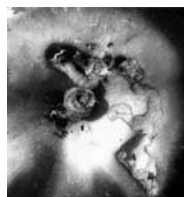
DLR Rheinland

"With codling moth, it's about timing and knowing the pest's life cycle," says Maury. "In Iowa, there are sometimes two generations we watch for." Maury sets codling moth pheromone traps in the orchard. Once he has trapped four or five male codling moths (this winged arrival of codling moth is termed biofix), he counts degree days—250 degree days base 50. At 250 degree days, Maury sprays.

Maury sprays three times, seven to 10 days apart. Maury had used Entrust (spinosad) for each application but altered his codling moth spray regime after a granulosis virus (Cyd-x), which is specific to the codling moth, came on the market. "Now my first spray is Entrust, second spray Cyd-x and third spray an Entrust/Cyd-x combination," he explains.

### Leafroller

While Maury uses Cyd-X exclusively to control codling moth, he does apply one round of Entrust before a single codling moth has landed. "There are a bunch of leafrollers early. When they arrive, before the presence of codling moth, I spray Entrust to clean up leafroller, then do the Cyd-x for each generation of codling moth once they arrive. Every orchardist has to figure out what works best for them. There's merit in using Entrust, then Cyd-x, then a combination."



### Apple Fly Maggot (photo by Andrew Forbes)

The apple fly maggot emerges early June in Maury's orchard and lays eggs in the pulp of apple fruit. When the maggot emerges, they eat through the flesh of the apple in a railroad pattern. "Purdue researchers figured out that the apple fly is attracted to a round red sphere," Maury said. Maury's family paints whiffle balls red, puts the balls in a baggie, applies Tangle-Trap, a clear sticky substance, and hangs the balls in the orchard. "In early June, you don't have any red apples, so the flies are attracted to the red round spheres and get stuck. Some organic growers will apply a little apple essence too. I don't want to attract any more than are already here. I load the trees heavily with red balls. We don't have an apple fly maggot problem. It's pretty much 100% trap-out, the only insect you can totally trap out organically."



### Plum Curculio

"Plum curculio is really the Achilles heel of organic growers," said Maury. The female bites into the side of the apples, makes a crescent shape, then turns around and deposits an egg. One female is capable of depositing 400-500 eggs. Wills family's first attempt at controlling the plum curculio mimicked a pre-World War II method. "It sounds like a joke but it's true," Maury laughed. "Imagine an inverted umbrella on a wheelbarrow with handles and a slot in the center. You set it under each tree, and tap each branch firmly with a padded stick. The plum curculio gets jarred from the branch, into the umbrella, and funneled into water or oil. We did



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### Runquist reflects on World Food Prize Borlaug-Ruan intership in India



*Claire Runquist traveled to Hyderabad, India this past summer as part of her World Food Prize Borlaug-Ruan internship, where she conducted research to help solve India's widespread nutrient deficiencies.*

**Stepping off the final plane after the 30-hour journey to Hyderabad, India this summer was one of the most surreal experiences of my life. By the time the plane landed, I was sleep deprived and barely remembered why I had traveled to the other side of the world alone in the first place.**

As I shuffled dazed toward the exit, I couldn't yet fathom the experiences that awaited me. My summer was full of research and friendship as I explored a foreign city and learned the customs of another culture.

I was part of the research being conducted at AVRDC-RCSA, (The World Vegetable Regional Center for South Asia). The first part of my research was learning about India's malnutrition problem. In India, a significant number of the population suffer from Vitamin A, Iron and Iodine deficiencies.

A big part of my research was working with the home garden projects. This is not a new concept, but AVRDC-RCSA's design has helped to specifically address the malnutrition issues, combats poverty and can work in any environment.

AVRDC-RCSA measures yields from a hectare of land with eight model home gardens for three different areas of India (Hyderabad, Punjab, Jharkand). While I was there, I got to design and plant my own model. By the end of the two months, I was able to harvest amaranth and palak (spinach) from my garden!

The next step was to prepare recipes with all of the vegetables. We basically made traditional Indian recipes modified to be more nutritious and then calculated the nutrition and tested the recipes for taste.

I also surveyed vegetable sellers at Lingampally vegetable market. The vegetable market was similar to our farmers' markets but much more disorganized, dirty and crazy. There were no tables, and most of the sellers did not actually farm. Those who did farm were relegated to the far end of the market, given a smaller amount of space and not treated as well.

As I boarded my return flight, it was hard to say good bye to my newly acquired Indian family. This summer experience was one of the most meaningful of my life, and it will always be a part of me.

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something very similar with long bamboo poles and a bedsheet and looked like a bunch of chickens picking them up."

Kaolin clay, or Surround, has helped solve Maury's plum curculio woes. Surround creates a powdery barrier between the fruit and pest. "The female doesn't like to go through the Surround, it gets all over her." Maury sprays Surround as soon as he gets fruit set, and sprays each week for six to eight weeks. "You can see the Surround on the fruit in the orchard, but they clean up nicely when washed."

#### Cedar Apple Rust

"This year has been the worst for cedar apple rust," said Maury. The spores from cedar galls affect the leaves. They created a crop failure for variety GoldRush this year in Maury's orchard. Maury did not treat cedar apple rust but heard from other growers who spray sulfur for scab that there was some cedar apple rust control with those applications. "We need to do a research project to explore good control options."



#### Deer

Wills Orchard's biggest pests are deer. "The deer get up on their hind legs and stand in the tree," said Maury. They have destroyed entire fruit regions. Maury has had some success putting a narrow electric fence on both sides of the tree row. "Deer have poor depth perception. If they try to jump, they are going to jump to the other side."

He has also had success using the 3-D electric fence model, where the middle row is situated outside the top and bottom rows. "The electric fences only work well when the battery's hot and require constant maintenance," said Maury.

Maury purchased an auger and is installing an eight-foot deer fence. He has situated a u-pick area inside the fence. He says, "People can pick easier where the deer haven't removed the bottom branches."