



Ohio Fruit ICM News

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If you have articles for the newsletter that you would like to have considered to be included in upcoming issues, please submit to either Howard Siegrist at siegrist.1@cfaes.osu.edu or Melissa Swearingen at swearingen.34@cfaes.osu.edu

Farm Pesticide Collections

Joanne Kick-Rack, State Director
Pesticide Safety Education Program
Ohio State University Extension

The Ohio Department of Agriculture has announced the dates and locations for the Farm Pesticide Collection Program. This pesticide collection service is free of charge for local farmers to properly dispose of unused farm chemicals. **The program is for farm pesticides ONLY.** No household or non-farm pesticides or chemicals such as paint, antifreeze or solvents will be accepted. **No pesticides will be accepted from commercial companies.**

The 2010 dates and locations are:

Hardin County

August 5, 10:30 a.m. - 2:30 p.m.

Hardin County Fairgrounds
14134 Fairground Road
County Road 40
Kenton, OH 43326

Putnam County

August 12, 10:30 - 2:30

OSU Extension Office, Putnam County
124 Putnam Parkway
Ottawa, OH 45875

Licking County

August 26, 10:30 a.m. - 2:30 p.m.

Ohio Department of Agriculture
8995 E. Main St.
Reynoldsburg, OH 43068

All collections will run from 10:30 a.m. - 2:30 p.m. The collections are sponsored by the Ohio Department of Agriculture in conjunction with the U.S. Environmental Protection Agency. For more information, or to pre-register, contact ODA, Pesticide Regulation Section at (800) 282-1955 ext. 31.

Information is also on the Pesticide Safety Education Program website at:

<http://pested.osu.edu/pesticidecollection.htm>



EMPOWERMENT THROUGH EDUCATION

North Central Ohio Tree Fruit IPM Program
Report Prepared by
Cindy Crawford (Erie County Adm. Assoc.)

Mike Abfall – East District IPM Scout
(Erie and Lorain Counties)

Date – 6/28/10

Apples

Spotted Tentiform Leafminer – 238.7 (down from 313.7)

Codling Moth – 1.1 (down from 3.3)

Apple Maggot - .14 (up from .13)

San Jose Scale – .53 (up from 0)

Oriental Fruit Moth – 1.94 (down from 2.3)

Lesser Appleworm – 0.8 (up from 0)

Dogwood Borer – 46.3 (up from 37)

Peaches

Oriental Fruit Moth – 0 (down from 0.8)

Lesser Peach Tree Borer – 0.7 (down from 0.8)

Peach Tree Borer – 0.7 (up from 0.3)

Date – 7/6/10

Apples

Spotted Tentiform Leafminer – 441 (up from 238.7)

Codling Moth – 1.0 (down from 1.1)

Apple Maggot – 2.56 (up from .14)

San Jose Scale – 0 (down from .53)

Oriental Fruit Moth – 2 (up from 1.94)

Lesser Appleworm – 2.3 (up from 0.8)

Dogwood Borer – 10.14 (down from 46.3)

Peaches

Oriental Fruit Moth – 1.7 (up from 0)

Lesser Peach Tree Borer – 0.6 (down from 0.7)

Peach Tree Borer – 1.9 (up from 0.7)

Date – 7/12/10

Apples

Spotted Tentiform Leafminer – 144.2 (down from 441)

Codling Moth – 1.0 (same)

Apple Maggot – .59 (down from 2.56)

San Jose Scale – 106.8 (up from 0)

Oriental Fruit Moth – 1.9 (down from 2)

Lesser Appleworm – 0.5 (down from 2.3)

Dogwood Borer – 4.5 (down from 10.14)

Peaches

Oriental Fruit Moth – 0.3 (down from 1.7)

Lesser Peach Tree Borer – 0.7 (up from 0.6)

Peach Tree Borer – 2 (up from 0.0)

Ted Gastier – West District IPM Scout
(Sandusky, Ottawa, Huron and Richland Counties)

Date – 6/28/10

Apples

Spotted Tentiform Leafminer – 145 (up from 94)

Codling Moth – 0.7 (down from 2.3)

Apple Maggot – 0 (first report)

San Jose Scale – 0 (same)

Oriental Fruit Moth – 13.3 (up from 6.5)

Lesser Appleworm – 0 (same)

Dogwood Borer – 3.04 (up from 0.8)

Peaches

Red Banded Leafroller – 28 (first report)

Oriental Fruit Moth – 2 (up from 1.5)

Lesser Peach Tree Borer – 1.8 (up from 1.7)

Peach Tree Borer – 1 (up from 0.7)

Date – 7/5/10

Apples

Spotted Tentiform Leafminer – 24 (down from 145)

Codling Moth – 0 (down from 0.7)

Apple Maggot – 0 (same)

San Jose Scale – 0 (same)

Oriental Fruit Moth – 7.7 (down from 13.3)

Lesser Appleworm – 0 (same)

Dogwood Borer – 4.3 (up from 3.04)

Peaches

Red Banded Leafroller – 0 (down from 28)

Oriental Fruit Moth – 0.8 (down from 2)

Lesser Peach Tree Borer – 1 (down from 1.8)

Peach Tree Borer – 3 (up from 1)

Date – 7/12/10

Apples

Spotted Tentiform Leafminer – 109 (up from 24)

Codling Moth – 2.3 (up from 0)

Apple Maggot – 0 (same)

San Jose Scale – 0 (same)

Oriental Fruit Moth – 11.2 (up from 7.7)

Dogwood Borer – 5.4 (up from 4.3)

Peaches

Red Banded Leafroller – 0 (same)

Oriental Fruit Moth – 0.5 (down from 0.8)

Lesser Peach Tree Borer – 1 (same)

Peach Tree Borer – 3 (same)

Wayne County Insect Trap Reports

Ron Becker - Program Coordinator

Week of 7/2

Codling Moth-Avg /trap , 3 traps per block
Wayne-.22 down from .67
Medina-.25 down from .33
Holmes-0 (same)

Week of 7/2

Oriental Fruit Moth
Medina – 2.0 up from .5

Week of 7/12

Codling Moth-Avg /trap , 3 traps per block
Wayne-7.56 up from .22
Medina-1.22 up from .25
Holmes-1.50 up from 0

Week 7/12

Oriental Fruit Moth
Medina – 0 down from 2.0

Red and two spotted spider mite populations are growing. Some bronzing starting to show. Some fruit cracking along frost lines. Biofix for the second flight of CM was declared on 7/7.

Apple Maggot Management

Rick Weinzierl, Department of Crop Sciences
University of Illinois Extension

In the latest issue of New York's *Scaffolds* newsletter (<http://www.nysaes.cornell.edu/ent/scaffolds/2010/>), Art Agnello included quick reminders on apple maggot damage. His recommendations apply equally well in northern Illinois where apple maggot is serious pest, so here is what Art had to say ...

Trap catches [of apple maggot adults] should be increasing in traditional high-pressure sites, owing to rainfall and soil conditions that are ideal for maggot development and adult emergence. Stings and larval tunneling could soon be detected in early and favored varieties such as Ginger Gold and Honeycrisp. If you aren't monitoring in specific orchards and haven't yet applied a protective spray against AM (and aren't using Delegate or Altacor for other pests – both of which have some activity on AM), prudence would suggest attention to this pest. Hanging a few volatile-baited sphere traps on the edge of susceptible plantings can provide a world of insight on when (and whether) immigrating flies are posing a threat. Growers on a Delegate or Altacor program for internal leps (codling moth) should get some protection against moderate AM pressure. [Imidan also is effective.] For those not using OP cover sprays, Assail and Calypso will both provide excellent control of apple maggot as well as internal leps.

Fujimite Now Sold as Portal

Rick Weinzierl, Department of Crop Sciences
University of Illinois Extension

I've been slow to include a note on a name change for the miticide fenpyroximate. This active ingredient has been sold for a few years by Nichino America as Fujimite but is now marketed in the eastern United States as Portal. Like Fujimite, Portal is labeled for use on grapes, apples, and fruiting vegetables such as peppers, eggplant, and tomatoes.

2010 Upcoming Events:

August 19-20, 2010 - Apple Crop Outlook Conference, US Apple Association, Ritz-Carlton Hotel, Chicago. See www.usapple.com for details.

August 19-21, 2010 - North American Fruit Explorers - Midwest Fruit Showcase. Best Western Motel/Conference Center, Lafayette, IN. To view the program and registration form, check: <http://web.extension.illinois.edu/edwardsvillecenter/foodcrophort3031.html> . For additional details or questions: contact Ed Fackler at cefackler@gmail.com or 812-366-3181.

December 7-9, 2010. Great Lakes Fruit Vegetable and Farm Market EXPO, DeVos Place Convention Center, Grand Rapids, Michigan. For more information: <http://www.glexpo.com> .

**Central Ohio Poison Control Number
(800) 222-1222
TTY # is (614) 228-2272**

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We gratefully acknowledge the continued help and financial support of our local county commissioners. We appreciate their input and participation in our programming efforts.

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Keith L. Smith, Ph.D., Associate Vice President for Agricultural Administration and Director, Ohio State University Extension
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Determining Apple Maturity

Peter Hirst, Dept. of Horticulture & Landscape Architecture
Purdue University Extension

Making the decision on when to harvest can be a very tricky and complicated issue. The longer you intend to store the fruit, the more precise your timing needs to be. For summer apples, most growers only intend to store them until their better quality fall apples come on stream, so storage times beyond a week or two are not that common. Even for fall apples, many growers aim to sell the majority of their crop immediately to the consumer, and try to be done by mid November or so. So since storage times are relatively short, harvest maturity is less important. This being the case, harvest apples when fruit are fully ripe. There are various tests for this, but taking a bite out of a few apples is just as good an indicator as any test. This also applies to apples intended for U-pick.

Bear in mind that even in cold storage, fruit continue to ripen, just at a slower rate. Therefore, fruit intended for longer term storage should be harvested when they are less ripe. There is no single test that will give you the answer but factors such as calendar date, heat unit accumulation, fruit firmness, soluble solids concentration, starch content and ethylene evolution all give answers to a piece of the puzzle. As you can see, this gets complicated real fast. Beyond the taste test, if you are going to perform one test I suggest looking at starch index. This gives an estimate of how much of the starch in the apple has been converted to sugar. So in Figure 2 the fruit with a rating of 0 that are completely black, are full of starch and not ready to be harvested. The fruit with a rating of 6 have almost complete conversion of starch to sugar and are ready for immediate consumption. This test is quick, easy, and doesn't require expensive equipment. For more details look in the Tree Fruit Pest Management Handbook, ID-93, available at <http://www.hort.purdue.edu/fruitveg> under bulletins.

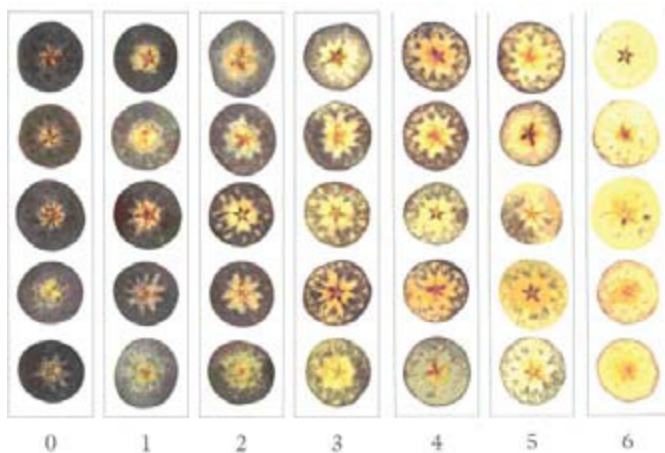


Figure 2. Starch pattern index of apples

Pristine™ Apple

Peter Hirst, Dept. of Horticulture & Landscape Architecture
Purdue University Extension

Although Pristine™ was selected in 1982, its history goes back to the early days of the PRI breeding program. From an original cross of Rome Beauty with *Malus floribunda* 821, selections and hybridizations were made incorporating Golden Delicious, McIntosh, Starking Delicious and Cazumat along the way. The cross that resulted in Pristine™ was Coop 10 x Cazumat made in 1974 at Rutgers University in New Jersey, and Pristine™ was selected at the Purdue Hort. Farm in 1982.

Pristine™ is a very early maturing apple – we've been harvesting them for about 2 weeks in West Lafayette. It is very attractive with a clean finish (Fig. 3).

For such an early apple, it has very good eating quality, certainly much better than other very early apples such as Lodi or Transparent. The texture is crisp and flavor has a good acid/sugar balance. If fruit are allowed to become over-mature, pre-harvest drop can be severe, but with timely pickings this should be a minimal problem. Fruit stores well for up to a month or more, but usually growers will probably only store the fruit until better quality, main season fruit comes along, such as Gala. Pristine™ has good field resistance to apple scab, and seems to have quite low susceptibility to fireblight and powdery mildew. Russet and skin disorders are rare, but bruising can be severe so careful handling is required.

For direct marketers, Pristine™ may be a very good way to kick off the apple season, or to transition from peaches into apples. But only grow them in such quantities that you can have them sold by the time main-season apples are ready.



Figure 3. Pristine Apple.

ReTain on Apples

Peter Hirst, Dept. of Horticulture & Landscape Architecture
Purdue University Extension

ReTain is a fairly new growth regulator that prevents the tree from making ethylene. SmartfreshSM on the other hand, does not prevent the tree or fruit from making ethylene, but prevents ethylene from acting, so even though ethylene is there, it cannot be sensed and therefore has no effect. As many growers know, ethylene is a hormone that causes abscission and pre-harvest drop and plays a key role in fruit ripening. ReTain is a harvest management tool that allows growers to spread out their harvest to better fit their labor or marketing schedules. This could be especially useful in U-pick operations. With most varieties, harvest delays of 7-10 days can be obtained using ReTain.

To be effective, ReTain must be applied before the large rise in ethylene production that signals the start of fruit maturation. If applied too early, the effects of the ReTain application may wear off prematurely, but if applied too late, a significant proportion of the fruit may have already started to produce ethylene. Remember that ReTain shuts down the production of ethylene, but once ethylene has started to be produced by ripening fruit, ReTain will not stop the fruit responding to it. Also bear in mind that ethylene is autocatalytic so that a small amount of ethylene triggers more and more ethylene production (like the snowball effect). ReTain should be applied as a single application 4 weeks before anticipated harvest. Keep in mind that the season is running 7-10 days early this year. Count back 30 days from this anticipated harvest date and from that point you have about 7 days to apply the ReTain. Remember that the PHI (preharvest interval) is 21 days, so you cannot legally harvest fruit for 21 days after you apply ReTain – yet another reason not to be late with your application.

ReTain should be applied in enough water to ensure good coverage and an organo-silicone surfactant should be added. Application Current bud stages West Lafayette, IN Apple Blackberry early apples being harvested harvesting underway Grape Peach fruit at veraison harvesting underway during slow drying conditions will increase absorption and better results will be obtained. Avoid spraying when temperatures are over 90F. On sensitive varieties such as Gala, Jonagold and Honeycrisp, some growers will use lower rates (as low as half rates) but this may also decrease the response.

One of the benefits of delayed harvest with ReTain is that fruit size and color continue to increase and are improved when fruit are harvested. Typically, lower incidences of superficial scald, watercore and internal breakdown are seen with the use of ReTain. ReTain is certified as an organic product.

Control of Preharvest Drop with NAA

Peter Hirst, Dept. of Horticulture & Landscape Architecture
Purdue University Extension

The traditional material used for stop drop control on apples is NAA (Fruitone N), a synthetic auxin. Other synthetic auxins you may have heard of include 2,4-D and 2,4,5-T. Of course you also know Fruitone N as a chemical thinner. Early in the season NAA knocks them off and later towards harvest it sticks them on. This highlights the importance of timing when using plant growth regulators.

Another newer stop drop material is ReTain. Although both NAA and ReTain can reduce preharvest drop, they do this in different ways. ReTain delays apple maturity whereas NAA does not delay maturity (and may even hasten it) but just reduces the fruit dropping. ReTain must be applied well ahead of the anticipated harvest date so a considerable amount of planning is required. NAA on the other hand needs to be applied just before apples start dropping, so in this regard can be viewed as a rescue treatment.

Once NAA is applied it takes about 3 days for the activity to kick in. After that you can expect about 7 days of drop control. Rates of 10-20 ppm are usually effective, but knowing exactly when to apply it can be tricky. If the application is made too soon, the effect may wear off before harvest is complete. If the NAA is applied too late, then too many apples will have dropped on the ground before the NAA starts having an effect. Wait until you start to see a few apples drop, and perhaps assist this by bumping a few branches and seeing if any apples drop. Then it's time to apply the NAA. Longer stop-drop control can be obtained with a split application, 10 ppm applied 7-14 days apart. NAA works best when the temperature is over 70F. Be aware that high rates of NAA (20 ppm) can advance fruit maturity.

NAA can be tank mixed and is compatible with a wide range of products. Always conduct a small test before mixing NAA with materials you haven't tried previously. Apply in enough water to ensure good coverage.

Monitoring and Management Strategies for the Apple Maggot

John Wise, MSU Trevor Nichols Research Complex
David Epstein, Larry Gut, and Luis Teixeira, Entomology
Purdue University Extension

Apple maggots (AM) overwinter as pupae and are developmentally ready to emerge as adults in early summer (900 growing degree-days base 50). Peak emergence generally occurs between 1,400 and 1,700 growing degree-days but is highly dependent on site-specific weather conditions. In 2010, most apple producing regions achieved 900 GDD the third or fourth week of June, and rain events provided good soil moisture conditions for apple maggot emergence. Low levels of apple maggot adult emergence have been detected at the [MSU Trevor Nichols Research Complex](#) in Fennville for the last three weeks.

Monitoring adult apple maggot flight is key to effective management of this pest. Adult activity can be monitored using yellow sticky boards with ammonium bait, or a red sphere trap covered with an adhesive and baited with synthetic fruit volatile. The yellow trap is most useful during the pre-oviposition period when newly emerged females are actively feeding. The red sphere trap mimics the ripening fruit that flies are attracted to during egg-laying, and is effective throughout the season. Comparisons of the two trap types in Michigan have revealed that the red sphere baited with fruit volatiles is the most effective, consistently catching three to four times more flies. Traps should be placed on the south-facing side of trees in perimeter rows because most flies are expected to be immigrating from wild hosts outside the orchard. Optimally, traps should be checked twice weekly starting just before 900 GDD base 50°F until the first fly is captured, then once a week thereafter to indicate the end of the flight.



The wing-banding pattern of the adult apple maggot fly.

Identifying apple maggots generally requires the use of a 10X hand lens. Adults are dark flies, approximately 6 mm in length. The most characteristic feature of the fly is the dark pattern on their wings (Figure 1). These wing-banding patterns are used to differentiate between fruit fly species. Apple maggot has four distinct black bands toward the wing tips, as seen in the accompanying illustration. Further identifying characteristics for the apple maggot include a white spot on the back of the thorax, and white bands across the top of the abdomen.

The greater the number of traps deployed per block, the greater the confidence level in basing treatment decisions on fly catch. Place at least two traps along borders that historically have been a source of infestation. Proper trap maintenance is crucial to trap effectiveness. Over time, the adhesive can be fouled by leaves, twigs, other insects and debris. Remove debris and insects each time traps are checked. The adhesive should then be evenly redistributed. In determining control treatment timing, on-farm fly catches should be used in conjunction with regional trapping information. Basing treatment decisions solely on regional information may lead to unnecessary insecticide applications. If you employ a good trapping program, a control treatment for apple maggots is not warranted until flies are captured on your farm. If flies are trapped on-farm, and a regional trap catch was recorded prior to the on-farm fruit fly capture, the treatment should be timed based on the earlier regional capture. This conservative approach is the best way to ensure that the control is applied prior to egg hatch. Chemical control of apple maggots is focused almost entirely on the adult, with the goal of preventing egg-laying.

Upon emergence there is an eight to 10 day period before female flies begin to lay eggs. During this time, they are searching for nutritional sources needed to become sexually mature. After female flies complete this pre-oviposition period and have mated, they will seek out fruit for egg-laying. They lay eggs just under the skin of ripening fruit with a needle-like ovipositor, making visual detection of the puncture wound difficult to distinguish from lenticels on the apple surface. Fly larvae, called maggots, hatch from eggs within a week and begin to feed in the flesh of the fruit. Maggot infestations will sometimes cause fruit to abort, but often the fruit will hang till harvest. Mature maggots drop out of fruit and enter the ground, where they pupate, starting the next generation's life cycle.

Control of the apple maggots has been traditionally achieved with organophosphate insecticides, like Guthion and Imidan, but some label or processor restrictions may limit their use near harvest. Synthetic pyrethroid compounds, like Asana, Warrior, Danitol, Decis, Battalion, Mustang Max and Baythroid XL, are also toxic to adult fruit flies, but are generally viewed to be moderately effective because they have a shorter field residual. There are several new reduced-risk and OP-replacement insecticide products that include apple maggots on their labels. The neonicotinoids Calypso, Clutch, Belay, Provado and Assail are labeled for apple maggot control. All three have performed well against apple maggots in small plot field-performance trials. Calypso and Assail have also performed well in on-farm trials conducted in Michigan over the past few years. The Spinosyn compounds Delegate and Entrust are highly active on APPLE MAGGOTS when ingested, but have shown to be only fair control materials in field trials with high pest pressure, thus are labeled for apple maggots suppression only. The new Diamide material Altacor is similarly active on apple maggots, and is labeled for population suppression.

GF120 NF Fruit Fly Bait (spinosad) is registered on pome fruits for control of apple maggots and is listed by the Organic Materials

Monitoring and Management Strategies for the Apple Maggot - Continued from Page 6

Review Institute (OMRI) for use in organic production. Because the primary route of entry is through ingestion, applying this product during the fruit fly pre-oviposition period is important for optimal performance. GF120 must be applied with specialized equipment, and is designed for low-volume application. Field efficacy data is encouraging, but we have limited experience with this novel tool to date.

The use of SURROUND WP for fruit fly control is based on creating a protective barrier between the plant and the pest that 1) reduces host recognition of the pest, and 2) prevents adult oviposition (egg-laying). Because it is not toxic to adult flies like conventional contact poisons, complete coverage of the plant is critical. Multiple applications are typically needed to attain initial coverage; further sprays may be necessary to respond to wash-off from rain or excessive wind. Field trials indicate that when adequate coverage is maintained, excellent fruit protection can be achieved.

Monitoring and management strategies for the apple maggot

John Wise, MSU Trevor Nichols Research Complex; David Epstein, Larry Gut, and Luís Teixeira, Entomology

Compound Trade Name	Chemical Class	Life-stage Activity	Optimal Spray Timing for apple maggots	Residual Activity	** Mite Flaring Potential	Effectiveness rating***
Guthion, Imidan, Malathion	Organophosphate	Adults & curative	7-10 days after the first fly is captured	14+ days	L - M	E
Asana, Warrior, Danitol, Decis, Mustang Max, Baythroid, Battalion	Pyrethroid	Adults	7-10 days after the first fly is captured	7-10 days	H	F-G
Delegate, Entrust*, GF120 NF*	Spinosyn	Adults	Immediately after the first fly has been captured	7-10 days	-	F
Assail, Calypso, Clutch, Belay, Provado	Neonicotinoid	Adults & curative	7-10 days after the first fly is captured	10-14 days	L - M	G-E
Altacor	Diamide	Adults	Immediately after the first fly has been captured	10-14 days	-	F
Surround WP*	Particle Film Protectant	Adults	Multiple applications before fly emergence	As long as thorough coverage of the tree canopy is maintained	L	E

*OMRI approved for organic production.

** Pollinator/Parasitoid toxicity rating; S – relatively safe, M – moderate toxicity, H – Highly toxic.

*** Effectiveness rating of insecticides (2010 Fruit Management Guide, MSUE bulletin E-154); E – excellent, G – good, F – fair.

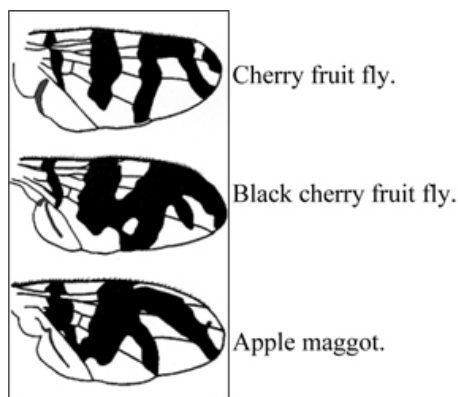
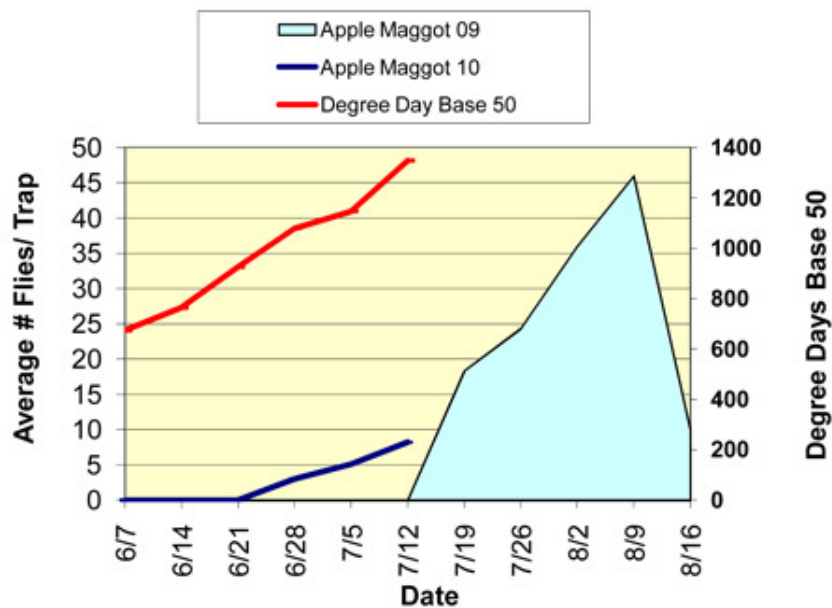


Figure 1. Wing banding patterns of deciduous fruit flies.

Monitoring and Management Strategies for the Apple Maggot - Continued from Page 7 & 8

2010 Trevor Nichols Research Complex Trapline Data
Fennville, MI

Warm Temperatures Continue

Article from *Facts for Fancy Fruit Newsletter*
Purdue University Extension

The warm temperatures of the 2010 growing season continue with growing degree day accumulation for the season now topping 1800 (Fig.1). This compares with around 1300 in a “normal” year. Actually temperatures now are about normal for this time of the year, and the reason we’re so far ahead of normal is our very early start to the season back in April. From the beginning of May temperatures have tracked pretty much normal (parallel lines on the graph).

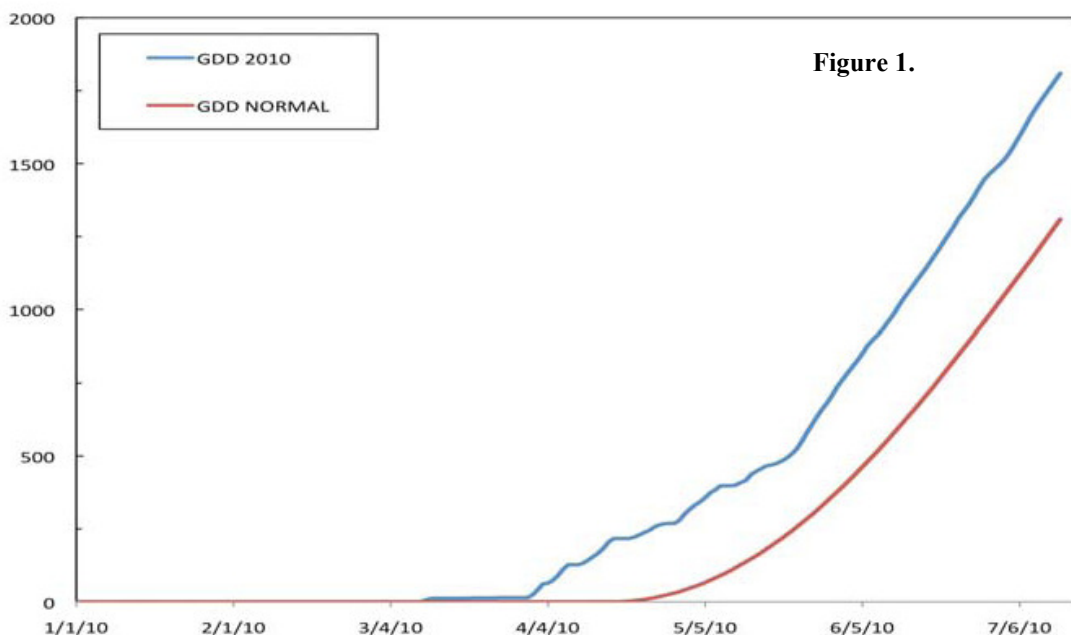


Figure 1.

New Strain of E. coli
Article from Facts for Fancy Fruits
 Purdue University Extension

A spring foodborne illness outbreak linked to a previously obscure strain of E. coli bacteria highlights an era of heightened public scrutiny and safety regulation for produce growers, industry observers say.

The nation's produce industry is in the crosshairs of the public health surveillance system following recent E. coli outbreaks, said Michael Doyle, director of the University of Georgia's Center for Food Safety, which has published more than 50 E. coli reports over the past seven years.

As testing technology becomes more sophisticated, "the system is picking up outbreaks that would not have been detected three or four years ago," Doyle said. "If the produce industry is going to stay ahead of the curve — and there are kinks in the armor — it's going to have to fill these gaps quickly."

E. coli can be found in the intestines of cattle, and outbreaks have historically involved ground beef tainted with the most commonly found strain, known as O157:H7. But over the past few years, produce industry concerns have grown following outbreaks stemming from contaminated lettuce and spinach.

In 2006, E. coli O157:H7-tainted spinach from California was blamed for the deaths of three people and illnesses in 200 others. Earlier this year, shredded romaine lettuce contaminated with E. coli O145, a lesser-known strain, sickened at least 26 people in five states. Three of those people suffered kidney failure, though no deaths were reported.

But the romaine lettuce case brought a unique twist: It was the country's first reported E. coli outbreak linked to O145, according to the U.S. Centers for Disease Control and Prevention.

In a May statement on the romaine lettuce outbreak, the CDC described O145 as an "emerging bacterial pathogen" that can produce the same illnesses as the O157 strains responsible for nearly all reported E. coli illnesses from the past dozen years.

An Ohio company, Freshway Foods, recalled romaine products after the Food and Drug Administration determined the tainted lettuce likely came from one of the firm's processing plants.

Of the more than 333 U.S. E. coli outbreaks since 1998 involving the eight most dangerous strains of the bacteria, more than 95% were linked to O157, according to CDC data.

It's not clear whether contamination from O145 and other less-common strains is on the rise, or if recent cases reflect improved or more-frequent testing.

There is limited data on the occurrence of non-O157 strains, according to the CDC, meaning O145 illnesses may go unreported. Many laboratories do not test for non-O157 strains because they're more difficult to identify, the CDC said.

Whatever the case, U.S. fruit and vegetable growers already face a changing regulatory landscape as the Obama administration steps up efforts to tighten food standards, and produce industry officials see expanded E. coli testing and other safety measures on the way.

Earthbound Farm's science advisors "strongly recommended" screening for six non-O157 E. coli strains, knowing that such strains may be included in new U.S. food regulations, said Samantha Cabaluna, communications director for the San Juan Batista, Calif., company.

The less-common E. coli strains are "not a fully recognized issue in foodborne pathogens," Cabaluna said.

Among U.S. growers, testing raw products for E. coli is "fairly limited" to lettuce, spinach and other leafy greens that have had a recent history of outbreaks, said Bob Whitaker, chief science officer with the Produce Marketing Association.

While the "overwhelming majority" of U.S. leafy greens growers are doing some kind of E. coli testing, little screening is done for the less-common strains, he said.

Over the past year, "many companies are looking at a more general screening for all types of E. coli, not just O157," Whitaker said. "Testing and other safety practices are improving and will continue to improve among growers. I don't see pressure for testing to go away."

New Strain of E. coli - Continued from Page 10

Tests conducted by Earthbound Farm, a San Juan Bautista, Cal.-based organic salad greens grower, suggest non-O157 strains are becoming more of a problem.

Of 120,000 microbial tests last year, about one in 1,000 showed presence of pathogens, and the “vast majority” were non-O157 E. coli strains, according to Earthbound Farm spokeswoman Samantha Cabaluna.

Pinning down E. coli sources is tricky for vegetable growers, observers say. E. coli may be spread through tainted irrigation water, runoff from nearby cattle ranches or by wild animals.

Additionally, the industry has many “risky” practices, said Boyle, of the Center for Food Safety, particularly in harvesting and processing. For example, head lettuce can be contaminated by E. coli from harvesting blades that come in contact with soil then cut and core the plant, he said, citing a 2008 study he helped conduct.

In coming years, pressure will probably only increase on the produce industry to strengthen pathogen testing and other safety practices, Boyle said.

Whitaker said there is a huge focus by the industry on E. coli, but cautions that testing has limitations and must be part of a broader safety program that keeps pathogens away from food in the first place.

“When these things happen, we’ve got to learn so this doesn’t happen again,” he said, referring to recent E. coli outbreaks. “Today, we know more than we knew in the past. This is a tremendous opportunity to improve our performance.” (www.thepacker.com)

Apple and Peach Nutrition

Peter Hirst, Dept. of Horticulture & Landscape Architecture
Purdue University Extension

While soil nutrient analysis is very useful prior to planting a new orchard, for an established orchard periodic foliar sampling is recommended. The results of foliar analysis shows what the tree has extracted from the soil rather than just what is in the soil. Sampling problem blocks may help shed light on causes of the problem and on other blocks regular sampling may help reveal trends that can help avoid future problems.

The best time to collect leaves for analysis is typically mid-July through mid-August (NOW). This is typically when extension growth has pretty much stopped and nutrient levels in the leaves has stabilized. As with any kind of nutritional analyses, obtaining meaningful results all hinges on taking a representative sample. Select one variety per sample – mixing leaves from different varieties will not give representative results of any variety. Samples should consist of 50-100 leaves, taken from the midpoint of current extension shoots around the periphery of trees. Collect 5-10 leaves per tree and take care not to sample spur leaves or those growing in the shade. Leaves should be collected with the petiole (leaf stalk) attached.

Washing leaves to remove dust or spray residue can cause as many problems as it solves, so growers should not wash leaves, but should wait as long as possible after applying pesticides before collecting samples. A list of certified labs that can analyze samples is given at:

<http://www.agrv.purdue.edu/ext/soiltest.html>



Late Season Monitoring of Scab and Summer Diseases

Janna Beckerman, Dept. of Botany & Plant Pathology
Purdue University Extension

The “June Monsoon” many of us experienced last month means that foliar diseases should be on the minds of growers everywhere. This extremely wet weather has resulted in a lot more foliar problems than previous years, and if it continues, suggests a bad year for the summer diseases, too. In addition to regular heavy rain falls, there have been constant light rainfalls as well, resulting in fungicide wash-out and prevention of re-application due to muddy conditions! As more and more growers use protectant spray programs, it is important to remember that higher rates, when possible, are the best approach to prevent disease, as captan is not as effective as the SI, or strobilurin classes of fungicides (when resistance isn’t an issue). During these types of conditions, growers should strongly consider using Flint, Sovran, or Pristine, which has better retention/redistribution than captan, and no 66-day PHI like mancozeb. The strobilurins have excellent control of the summer diseases.

Scab monitoring: When scouting, a small hand counter-clicker is useful to keep track of the number of shoots and clusters checked. When you find a leaf with one or more lesions, put it in your pocket. Monitoring for each problem should be done separately to avoid both counting errors and confusion. When the clicker reaches 100, stop and count the number of scabby leaves you have collected. Inspecting a block for scab requires looking at a lot of leaves. Don’t study each leaf, but glance over clusters of 15 leaves at a time (Fig. 4).

You have to look at each cluster twice, once for the upper leaf surface and again for the underside. By looking at about 15 leaves per cluster/shoot on 100 clusters/shoots, you will be checking about 1500 leaves. Minimum: check 100 fruit clusters or vegetative shoots per block. Select the cluster/shoots from tree at least 10 trees per block. Your sample of fruit clusters and vegetative shoots should come from at least 10 trees per block (i.e. no more than 10 per tree). Checking 5 clusters/shoots per tree on 20 trees is even better. Randomly select clusters and shoots from all areas of the canopy. Problems due to improper spray distribution can be limited to one section of the tree. Interpretation Plant pathologists suggest a threshold of 0.5% infested leaves (i.e. 8 infested leaves out of 1500 leaves checked) as a reasonable guess at a threshold for suppression treatments. If you find less than 5 scab-infested leaves per 100 fruit clusters & vegetative shoots, this suggests that protection during primary (ascospore) scab infection periods was adequate. Conversely, if you find 18 or more scab infested leaves per 100 clusters and shoots, the evidence suggests that lesion suppression is needed. If the number of scab-infested leaves per 100 clusters/shoots is between 5 and 18, you can either increase the sample to see if a clear result comes out, or quit sampling and identify the degree of scab infestation as intermediate.



Figure 4. Leaf cluster with scab in an alternate row sprayed block. Scab suppression was obviously not achieved! No scab was observed in blocks that received the full rate.



Figure 5. Sooty blotch/flyspeck

Sooty blotch/Flyspeck and bitter rot: Sooty blotch and flyspeck are two distinct diseases (Fig. 5), caused by over twenty different species of fungi. However, these disease complexes usually occur together, and because their disease cycles and control procedures are similar, they are frequently “lumped” into a single disease complex. Sooty blotch, as its name suggests, appears as sooty brown or black blotches on the surface of developing apples. Blotches vary greatly in size, but may be 1/4” in diameter or larger. Several blotches may coalesce to cover relatively large areas of the fruit. The signs of flyspeck appear as a group of tiny, distinct black dots, with numerous individual dots making up a single cluster. Both diseases may be found on a single fruit. And even though they look like black dots, microscopic and genetic studies have identified multiple fungi as causing these problems.

At midseason, observe 25 fruit in the interior canopy of sample trees. Symptoms are more likely to be found in poorly pruned trees in the wetter, foggy, slow-drying areas of the orchard. Expect first symptom

expression by early to mid-July. Continue to observe 25 fruit in the interior canopy of sample trees. Fungicides should be applied to fresh fruit showing any infections. Presence of these diseases is a good indicator that fungicide surface residues are lacking or very low, and signals potential need for treatment to control these diseases or the decay producing fungal pathogens. The most disease is likely to be found in low areas of the orchard where drying may be slower.

Tips for Storing Peaches and Nectarines

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University of Illinois Extension

With peach and nectarine harvest nearing full swing, some fruits will likely be kept in storage for later sales. Unlike apples, peaches and nectarines do not store for a long time at low temperature. The alternative for many is to plant varieties of different maturity dates in order to extend the season. One of the biggest problems with storing peaches and nectarines at low temperature, below 40°F, is that they develop a mealy or wooly texture. Wooliness or stringiness is a chilling injury response to low temperature storage. It is well known that during normal ripening of peaches, enzymes that break the cell wall, causing the fruits to soften, such as polygalacturonases and pectinmethylesterase, are activated. However, when fruits are stored at 32 to 36°F, the activity of some of these enzymes is reduced substantially. Without these cell wall breaking enzymes, peach and nectarine fruits will not soften properly even when kept at room temperature for a long time; instead the fruit becomes stringy or mealy. Several methods have been used to avoid wooliness or stringiness in peaches, including harvesting fruits at full maturity or early ripe stages, intermittently warming the fruits during storage, treating the fruits with ethylene, and spraying fruits in the field with gibberellic acid, GA3.



Harvesting fruit at full maturity is somewhat difficult to predict precisely because most peach and nectarine varieties on the market are high coloring. One of the methods used to estimate fruit maturity is to use ground color as an indicator of when to harvest. Ground color is the color of the skin away from the sun on the shaded side of the fruit. If the color has any tinge of green, then the fruit has not reached full maturity. In the photo below you can distinguish the sunny side from the shaded side. Fruits will store 10 to 14 days longer (develop less wooliness) when they are picked when the shaded side has turned yellow or deep orange. For high coloring cultivars, it is difficult to use ground color as an indicator of early ripening or full maturity. You might use either days from full bloom or degree-day models to decide when to harvest. If the fruits are picked too soon, you can expect between 20 to 35% of the fruit to be wooly after 3 weeks in storage.



Intermittent warming during cold storage is another way to reduce wooliness of peaches and nectarines. Warm Fruits coming from the field should not be put in storage immediately after harvest. Fruit should be kept in a shed or in a cool storage (65 to 70°F) for several hours, before they are placed in cold storage. Chilling injury is much worse when fruits are put in cold storage immediately (when they are hot) than when they have cooled. For this reason it is best to harvest fruit very early in the morning than in the middle or late in the day. You can also reduce chilling injury by washing fruit with cold water 55 to 60°F before it is placed in storage. Studies have shown that fruits that have been picked early in the morning, cooled for a few hours in a shed or by drenching with cold water may be placed in cold storage at 35 to 40°F for up to four weeks without developing significant wooliness, especially if the fruit are taken out of storage every two week for 12 to 18 hours, placed in a cool place (65 to 70°F), then returned back to the

cold storage at 35 to 40°F. In other words, by taking the fruits out of storage for a few hours every two weeks they will not likely be stringy when they soften. It is a tedious process, but it seems to help the fruit ripen after storage.

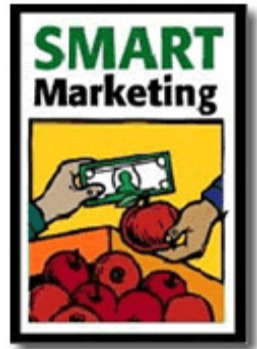
Another method that has been used to reduce wooliness is to treat fruit after harvest with 10 to 15 ppm ethylene. Ethylene is the hormone that causes the fruits to ripen. Peaches are classified as climacteric fruits. Climacteric fruits are those that need ethylene to ripen (such as bananas and tomatoes). Peaches produce some ethylene, but when the fruits are kept at low temperature the ethylene synthesis process is damaged. By treating the fruit in storage with ethylene, the enzymes that cause the fruits to soften are stimulated and wooliness is reduced. I have not seen this being applied commercially, but it is worth experimenting with if you have the tools to inject ethylene. You may also store fruits that produce higher levels ethylene with peaches and nectarines, like apples. Unfortunately apples mature at later dates than peaches and nectarines.

Storing peaches under controlled atmosphere has also been shown to have some positive effect on reducing wooliness in peaches, but the effect is not consistent. Controlled atmosphere is used extensively to store apples, but has little effect on extending the storage of peaches. One experiment have shown that treating fruits with gibberellic acid delayed ripening of peach and reduced wooliness, but the results have not been confirmed.

Last year, I bought fruits from our local grocery store in mid-August that were stringy and never softened. Here are a few tips on how to avoid this. Harvest fruits during the cold part of the day (early morning); avoid putting fruit in storage when they are hot; acclimate the fruit at 60 to 70°F for a few hours before storage or at least keep them in a cool shed; store fruits at 35 to 40°F but take them out of storage for a few hours every two weeks.

To Buy or Not To Buy...Influencing Your Customer's Purchases

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Do you wonder what is going through a customer's mind when they come to your business, pick up a product, look it over carefully, and then put it back and walk out?? Do you ask yourself, "What happened to that sale?" Consumer decision making is a complex science about how consumers make purchase decisions: is it impulse or planned, do consumers do research, do they consult a friend or use their own judgment? Is there a way you can help convert a store visit into a sale? Consumer decision making can be broken down into several simple steps, many of which, as a business person, you can influence.

We all go through a process when making a decision. For routine items we buy every day, we know well, and that have a relatively low price tag, that decision can be very quick. For other items that are more complex, for which we really don't know much about, or that are very important the process can become complex and lengthy.

All buying decisions are sparked by a need (or an "I want"!): I just ran out of eggs, my car broke down, I love that flat screen TV. Marketers further develop our needs and wants. How? Certainly, forms of advertising greatly influence us. Advertising can take many forms, reminders for those everyday items, educational for those new items, or persuasive for those items that you may not really need but would love to have. Often sales promotions help, buy one get one free, new flavors, sizes and packages can grab their attention. Signage at the point of sale is a great tool to draw consumer attention. Loyalty programs also help but make sure it delivers real benefits to your customers (some of the best loyalty programs right now are with supermarkets offering discounts on gas).

Once consumers recognize a need, they begin an information search. For the eggs that I just ran out of that search is relatively easy. I quickly scan my internal memory for how to get eggs quickly and easily, and I think of the closest place I can go to get eggs. Not much thought or involvement there. But what about a need for a medical procedure or a purchase of an expensive new piece of farm equipment? These types of decisions require an "external" search. You might start talking to friends, do some research on the web, visit equipment dealerships. High risk and high prices typically produce longer and more extensive information searches.

How can you, as a marketer, influence your customers' decisions? Make sure your website is up to date and easy to navigate and make sure the resources on it are helpful and easy to read. Today, many people start their information search on the web, and if you don't have a presence there, you may be over looked. Complex decisions require clear information, education, and often extensive customer service. Have educational information readily available, be helpful, offer tours and demonstrations, but maybe most important, offer yourself as a personal consultant for your customer, providing information and follow up throughout the information search process.

Once consumers have collected their information, the next step is to evaluate the alternatives. Which doctor should I select for the procedure, which hospital is best, what farm equipment dealership has the best equipment, which brand has the best warranty, which had the best service department, and who has the most competitive price? Usually in these complex situations we decide what attributes are most important to us and set criteria, say maximum price, or best doctor, as our most important attribute when making the decision. As a marketer how can you help your customers work through the evaluation of all of the alternatives? You can find out from them what is most important and work toward attribute. You can boldly compare your product against your competitors and easily illustrate the differences for your customers (think about insurance companies who do this a lot).

Once consumers have carefully weighed their alternatives, a purchase usually results. Wait! Your marketing commitment is not over yet. Now is the time to help your customers avoid suffering from "buyer's remorse," that nagging feeling you get after making a major purchase; when you start to wonder if it really was a good decision. Consumers want reassurance that they made the right decision, and marketers can help their customers feel confident about their purchases. How about follow-up emails, letters, thank you postcards that can also provide additional information about the product they just bought? And how about a phone call a month or two after the sale...does the customer have any questions, is everything working properly? This is also a good time to remind them of other services/products that you have that may complement or enhance the product they just purchased from you.

Remember, the more complex, risky and/or expensive a purchase decision is, the more "help" a consumer needs in making that decision. As a marketer your chances of converting a visit to a sale is much better if you can influence a customer from need recognition to alleviating buyer's remorse.

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