Ohio Fruit ICM News
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In This Issue

Calendar

December 15: OFGS Research Committee Meeting, 10 a.m. - 2 p.m., Dutch Heritage, Bellville.

December 19: Open House to honor Ted Gastier upon his retirement, Huron County Extension Office, 180 Milan Avenue, Norwalk, OH, 3:00 to 6:00 p.m. Contact Persons: Kathy or Amy at 419-668-8219

December 19: In-Depth Fruit School on Intensive Fruit Production - A Systems Approach, 8:00 AM - 4:30 PM. Featuring presentations by Dr. Dave Ferree, Ohio State Professor Emeritus and expert on light management in intensive systems, and Steve Hoying, Cornell Pomologist with 20 years experience researching tree fruit planting systems. Adams County Agricultural and Natural Resources Center, Gettysburg, PA. Contact Person: Tara Baugher, tab36@psu.edu or 717-334-6271, ext. 314.

December 22: North Central Ohio Fruit Crops Breakfast, MAWs Place, U.S. Rte 250 north of Milan, 8:00 a.m. We have applied for Private Applicator credit for Core and Category 4.

January 4-6, 2006: North American Berry Conference. Please note that this conference is being held more than a month earlier than usual. Please register and make other arrangements earlier than in other years. This meeting is being held at the Savannah International Trade and Convention Center in Savannah, GA, and is immediately followed by the SE Regional Fruit and Vegetable Conference, January 6-8. More information is available at <www.nasaga.org>.

January 16-18, 2006: Ohio Fruit and Vegetable Congress and Ohio Direct Marketing Conference, Columbus Convention Center.

Three New Pesticide Options for Berries
Source: Kathy Demchak, Dept. of Horticulture, PSU, Fruit Times Volume 24, No. 11, November 29, 2005

Here are some new options for chemical pest control in berries in PA. If youre from another state, please be sure that these products are registered in your state before using them. Thanks to Dr. Doug Pfeiffer at Virginia Tech for his assistance with information for this article.

Kanemite® 15SC (active ingredient: acequinocyl) from ArvestaÔ is a new miticide for use on strawberries against two-spotted spider mites and strawberry mites. It has a unique mode of action (Group 20 Subgroup B), so other miticides can be alternated with it for resistance management purposes. The label states that no more than two applications should be made per year (one would be even better to delay resistance development), and there should be a minimum of 21 days between applications. This material is relatively harmless to predatory mites and beneficial insects. The use rate is 21-31 fl. oz./acre. The PHI is 1 day, and the REI is 12 hours.

A new supplemental label for Capture® 2EC (active ingredient: bifenthrin) from FMC now allows its use as a soil drench against raspberry crown borer larvae. Capture® had previously been labeled for use on caneberries as a foliar spray against leafrollers, orange tortix, root weevils (adults), and spider mites (maximum rate must be used for efficacy). However, this supplemental label may be of greater value in PA, especially considering that the only other material that could be used for crown borer larvae was azinphos-methyl (known as Guthion or Sniper), and that use would not have been allowed after Sept. 30, 2006. The soil drench, at 6.4 oz of product/acre, is to be directed to the crown of the plants in the fall or spring. This timing targets stages in the crown borer life cycle when the larvae are vulnerable. If Capture® is used in the spring prior to bloom, you can make either foliar or soil drench applications, but not both. The PHI is 3 days, though this is of concern essentially for the foliar applications with other pests. The REI is 12 hours. You may also already be familiar with this active ingredient as it is labeled for strawberries as Brigade.

There's a new use for Danitol ® 2.4EC (active ingredient: fenpropathrin) from Valent®, which had been labeled for an assortment of insects on strawberries. Now Danitol® 2.4EC also can be used on most bushberries (blueberries, gooseberries, and elderberries (see the label for other crops) against blueberry maggot, Japanese beetle, and obliquebanded leafroller. It can be used against cane borers on currants as well. The PHI for most of the bushberries (blueberries included) is 3 days; however, the PHI for currants is 21 days. The rate in all cases is 10 2/3 to 16 fl. oz./acre. Applications must be made using ground equipment. The REI is 12 hours.

Both Capture® and Danitol® are pyrethroids, so they can affect a fairly wide range of non-target organisms including bees, beneficial insects and aquatic organisms. Both of

these materials are restricted use, and carry the signal word Warning. Kanemite® carries the signal word Caution. Be sure to follow all label precautions.

Growing Berries - What Does It Take?
Source: New York Berry News, Volume 04, Number 10, November 15, 2005

What is the toughest part of organic berry production? According to Marvin Pritts, it is weed control. Organic growers need to study their soils and put their production fields into cover crops before initial planting. Steep slopes (greater than 5%) should be avoided as they will erode easily and are hard to cultivate and irrigate consistently. Moderate slopes (3 to 5%), on the other hand, allow air to drain and reduce the high humidity around the plants. This is highly favorable for berries as it reduces diseases as well as the risk of frost injury. Says Pritts, Steep, south-facing slopes tend to increase the risk of frost injury in the spring because plants generally bloom earlier. However, west-facing slopes present the greatest risk for winter injury because plants are exposed to persistent, desiccating winds in winter.

A major step in site preparation is getting rid of perennial weeds, both organic and conventional growers. Weeds cause more economic loss in berry production than diseases and insects combined.Pritts notes. Eliminating weeds the year before planting is much easier than controlling them after planting. Starting site preparation two or three years in advance to eliminate existing weeds will be rewarded in future years and is especially important if the berries are going to be grown organically.Cover cropping the site, repeated cultivation or covering the site with black plastic for several months are also effective.

Before planting a cover crop, the soil needs to be tested for pH, potassium, phosphorus, magnesium, calcium, and boron. A composite sample from ten or more locations in the field, to a depth of 10-12 inches is recommended. It takes a year for either lime or sulfur to affect the pH, so these should be added one year before planting. Animal manures and legumes offer a good source of slowly released nitrogen; however, animal manures can contain weed seeds. Also, manures need to be well composted and worked into the soil prior to planting to minimize the risk of fruit contamination with pathogenic bacteria.

Experts advocate the use of cover crops on the planting site the year before planting, not only to improve soil structure, but to suppress weeds. The choice of cover crops will depend the soil its pH, drainage, soil moisture, and time of year for establishment. Pre-plant cover crops are usually plowed under in the late fall or early spring prior to planting. Unless the soil and site are prone to erosion, crops with low nitrogen contents such as grains and grasses should be plowed under early in the fall to allow time for

decomposition. Legumes contain more nitrogen and decompose quickly so they can be turned under within a month of planting.

Following are a few cover crops covered in the class handouts:

1). alfalfa, brassicas (mustards are increasingly popular as a pre-plant cover crop because they contain certain chemicals that suppress weeds, nematodes and other soilborne pathogens and they have an extensive root system);

2). buckwheat on sites with a low soil pH; clovers;

3). fescues (used both as a pre-plant and a permanent cover crop in fruit plantings, often in combination with white and red clover;

4). alfalfa (plantings are made in the fall);

5). annual field brome grass;

6). hairy vetch (not to be confused with crown vetch);

7). and marigolds!

Pritts' literature notes that marigolds are a relatively new cover crop that has generated much interest among growers for its ability to suppress weed and nematode populations. The seeds will germinate only when soil temps exceed 65 degrees F. They do not have to flower to provide benefits and can be plowed under after growing for three months or more. Others choices include: Japanese millet; spring oats; winter rye, annual ryegrass; Sudan grass; and Sorghum-Sudan grass hybrids. Each of these has a different planting time, soil requirement, seeding rate and purpose as a cover crop. Growers need to do their homework to decide what will work best on their farm.

Elderberry Research and Production in Missouri
Source: Patrick Byers, Department of Fruit Science, Missouri State University and Andrew Thomas, Southwest Research and Education Center, University of Missouri via New York Berry News, Volume 04, Number 10, November 15, 2005

The Elderberry (Sambucus nigra L. ssp. canadensis (L.) R. Boll) is native to much of North America. The plant is a medium to large shrub or small tree. Foliage is pinnately compound, and the stems are noted for large, raised lenticels. Flowers are borne in flattened panicles, usually in May, and fruit ripens in July, August, and September. Flowers and fruit are produced on both current seasons shoots and on older wood.

Elderberries were undoubtedly utilized by Native Americans, and were harvested from the wild by European settlers. Organized efforts to improve thenative elderberry, however, began in the 20th century. The cultivars Adams 1 and Adams 2 were selected

from the wild by William W. Adams in New York in 1926. Ezyoff, of unknown parentage, was introduced by Samuel H. Graham of Ithaca, New York, in 1938. More recent breeding efforts at the Kentville, Nova Scotia experiment station have resulted in Johns (1954), and Nova, Scotia, Kent, and Victoria, all released in 1960. The Nova Scotia releases are all seedlings of either Adams 1 or Adams 2. The latest release, York (1964), is a cross of Ezyoff and Adams 2 and was developed by the New York Agricultural Experiment Station.

A review of the elderberry literature reveals studies at Pennsylvania State University on elderberry culture, and at the University of Illinois on fertilization and cultivar evaluation. Recent work has focused on elderberry juice composition and the use of elderberry juice as a colorant. Reported elderberry investigations in Missouri prior to 1997 were limited to cultivar testing at the State Fruit Experiment Station of Southwest Missouri State University.

The elderberry is a native, adapted plant in Missouri, and there is a demonstrated, growing demand for elderberry fruit and flowers from winemakers, jelly processors, and producers of various nutraceutical preparations. Commercially available cultivars were developed elsewhere, in New York and Canada, and native midwestern germplasm has not been utilized to any extent in the development of adapted cultivars. Research-based information on suitable cultural practices is lacking; numerous possibilities for cultural studies are available.

The Elderberry Improvement Project was initiated in 1997 from discussions among Patrick Byers of the SMSU State Fruit Experiment Station (SMSU-SFES), Andrew Thomas of the University of Missouri Southwest Research and Education Center (UMC-SWREC), and Alan Erb, formerly of Kansas State University (KSU). The project also received initial and ongoing support from John Brewer of Wyldwood Cellars, Mulvane, Kansas. Chad Finn, with the USDA-ARS laboratory in Corvallis, OR, joined the project in 2000.

The Elderberry Improvement Project has evolved into three components:

1. Collection of native elderberry germplasm

2. Replicated evaluation of superior native germplasm

3. Cultural studies

The collection of native germplasm was initiated in 1997 and is ongoing. The plantings are maintained at the SMSUSFES, UMC-SWREC, and at Corvallis. Available commercial cultivars were obtained from KSU and commercial nurseries. John Brewer donated selections from his elderberry project.

Superior elderberries were solicited from elderberry enthusiasts among the public. Other superior elderberries were gathered during collection trips. At present (2005) the

collection consists of 6 named cultivars, 31 selections from Missouri, 2 selections from Kansas, 3 selections from Oklahoma, 5 selections from Arkansas, 1 selection from Tennessee, 3 selections from North Carolina, and 4 selections of the European Elder. The collection includes 55 selections and cultivars. Information collected includes phenology and plant growth, harvest date, yield, panicle size, berry size, fruit quality, and ratings of disease and insect problems.

The replicated evaluation of superior native germplasm began in 2003 and is ongoing. Replicated plantings were established at the SMSU-FES in Mountain Grove and UMC-SWREC in Mount Vernon which include 10 advanced selections and 2 commercial cultivars (Johns and Adams 2). Our hope is to identify elderberry cultivars with sufficient merit for release and commercial planting. This component of the project was expanded in 2004 with the establishment of a study to investigate the effects of environment on the expression of genetic traits in elderberry; Chad Finn with the USDA-ARS is a cooperator on this study. Data collected in these studies include phenology and plant growth, insect and disease ratings, panicle yield, panicle size, berry yield, berry size, and juice parameters. We are particularly excited about our collaboration with Dr. Penelope Perkins-Veazie at the Lane, Oklahoma, USDA experiment station. Dr. Perkins-Veazie and her lab will measure antioxidant levels in fruit samples from each of the selections and cultivars in the replicated study.

A study was initiated in 2000 to investigate 4 pruning strategies: annual removal of all shoots, removal of all shoots every 2 years, training to a tree form, and no pruning. Data collected in this study includes phenology and plant growth, insect and disease ratings, panicle yield, panicle size, berry yield, berry size, juice parameters, and antioxidant levels.

Future directions in the Elderberry Improvement Project include the following:

· Continued collection of superior native germplasm

· Naming and release of superior selections

· Entering superior selections into the germplasm repository system

· Additional cultural studies in such areas as fertility management, insect and disease management, and harvest management

The Elderberry Improvement Project would not have been possible without the support of Southwest Missouri State University, the University of Missouri, Kansas State University, the USDA National Plant Germplasm System, the Northwest Center for Small Fruit Research, and John Brewer and Margaret Tidwell. In particular we appreciate the contributions of the administrations and staff of the SMSU State Fruit Experiment Station and the UMC Southwest Research and Education Center.

The information presented here is gathered from several sources (see references), including our experiences with the Elderberry Improvement Project. Several elderberry cultivars are available commercially, including Adams 1, Adams 2, York, Nova, Scotia, Kent, and Johns. Of these, in our trials Adams 2 has consistently outperformed all others. Recommendations from other regions include all these cultivars. A large portion of the commercial fruit crop, especially in the Midwest, is harvested from wild plants. Among the native selections in our trials are several that outperform Adams 2.

Elderberries are easy to propagate. Root cuttings (pencil diameter or slightly smaller, 4-6 inches long) may be dug in early March before growth begins. The cuttings are placed horizontally in a flat or pot, covered with .75 to 1 inch of a light soil or soiless medium, and kept warm and moist. Often a single root cutting will produce 2-3 plants. Dormant hardwood cuttings root easily. Collect 3-4 node cuttings before growth begins in the spring, and place the basal 2 nodes below the surface of a well-drained soil or medium. Be sure that the cutting wood is not cold damaged. A dip of the basal end of the cutting in an IBA rooting powder may increase rooting. Sprouted hardwood cuttings and softwood cuttings are also easily rooted, provided provision is made to maintain high humidity around the cuttings until rooted. An intermittent mist system works well. A rooting hormone dip may be beneficial. Cuttings of 2 to 3 nodes root well. Remove a portion of the foliage from softwood cuttings (we usually leave only the 2 basal leaflets of each leaf). Softwood cuttings typically root well until about July 1; rooting percentage drops as the summer progresses.

Bare root 1-year plants dug from a nursery work well for planting establishment. Recently propagated container-grown plants may be used to establish plantings during the same season. Our plantings are on raised ridges (berms) that are spaced 12 feet apart. Plants are spaced 4 feet apart in the planting row.

Elderberries produce fruit on shoots older than one year, and produce suckers from the crown or root system that will bear fruit the first year. Several references recommend a selective removal of older shoots when pruning. Initial results from the Mountain Grove pruning study suggest little difference among the four pruning treatments in either panicle yield or berry yield. We have learned that the average size of treatment 1 (the annual removal of all shoots) panicles is significantly larger, suggesting that current season suckers produce larger though fewer panicles. Most of the panicles on treatment 1 plants were harvested in two harvests, over a period of two weeks.

We apply nitrogen annually to the elderberry plantings. Mature plantings receive 60 to 80 pounds (per acre) of nitrogen, applied at bud break in late March to early April. We apply other nutrients every second year, using a complete fertilizer as the nitrogen source. Elderberries are not drought tolerant, and we irrigate the plantings during dry periods. We use trickle irrigation. The plantings are also mulched, to help conserve soil moisture.

While elderberries are relatively pest resistant, we have noted several potential problems in our plantings. An unidentified stem borer causes wilting and dieback of new shoots in April and May in the Mountain Grove plantings. Larvae of a sawfly have defoliated

plants at the Mount Vernon site. The adult elder borer, also known as the elderberry longhorned beetle, has been collected at both the Mount Vernon and Mountain Grove sites . The larva of this spectacular beetle bores into the woody parts of the plant. Stink bugs are routinely noted on ripe panicles, but the amount of damage is unknown. A potentially damaging pest is the eriophyid mite, present at both the Mountain Grove and the Mount Vernon sites. This mite causes cupping and crinkling of the foliage, and can cause abortion of florets and young fruit. The economic impact of this pest is unknown. Fall webworms were also noted in the Mount Vernon planting. An unidentified leaf spot disease, which usually is noted in midsummer, can cause premature leaf drop and occasionally defoliation. Birds of several species will feed on elderberry fruit; those selections with pendulous panicles appear to be less attractive to birds.

Elderberry harvest takes place in late July, August, and early September. Entire panicles are clipped and harvested when all berries are fully colored. The panicles on current seasons shoots ripen later than panicles on older wood. A bush with shoots of mixed age will ripen fruit over a 3-week period. We harvest plants at weekly intervals. Berries may be removed from the panicle by freezing the entire panicle and shaking off the fruit. The berries may be refrozen and processed as needed.

In the early 1970's, Dr. Skirvin of the University of Illinois reported on yields from an elderberry trial that included Adams 1 and Adams 2. Average yields over the two cultivars were 1214 lb/acre in the first year, 8677 lb/acre in the second year, and 8582 lb/acre in year 3. Maximum yields (for Adams 2) were 3735 lb/acre in the first year, 13495 lb/acre in year 2, and 13846 lb/acre in year 3.

The average yields for Adams 2 and the selection Gordon B from the pruning trial at Mountain Grove were 1226 lb/acre in the first year, 3338 lb/acre in year 2, and 5621 lb/acre in year 3. Gordon B had the highest yields in this trial - 1842 lb/acre in the first year, 4868 lb/acre in year 2, and 7572 lb/acre in year 3. In the first harvest year (2004) of the replicated selection/cultivar trial at Mountain Grove, the highest yield, 11352 lb/acre, was reported for the selection Wyldwood 1.

The following table includes juice parameters from the 2002 harvest:

Table 1: Means of juice characteristics from 2002 elderberry harvest at two locations:

Site	# Samples	Brix	pH	TA (ml)
Mt.Vernon	34	11.44	4.72	0.85
Mtn. Grove	26	12.59	4.56	0.92
Combined	60	11.94	4.65	0.88

At present, most of the elderberries grown in the Midwest are harvested for processing markets. Several wineries produce elderberry wines from the fruit, and the flower panicles are used to flavor wines. Jelly and jam are produced from elderberry juice or

blends of elderberry and other fruits. Elderberries contain high levels of antioxidants, and elderberry juice and concentrate are marketed as nutraceuticals. The pigments in elderberry juice are suitable for colorant use.

References

1. Craig, D. L. 1978. Elderberry Culture in Eastern Canada. Information Services, Agriculture Canada, Ottawa K1A 0C7.

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5. Skirvin, Robert M., and Alan Otterbacher. 1977. Elderberry Cultivar Performance in Illinois. Fruit Varieties Journal 31:7-10.

6. Stang, E. J. 1990. Elderberry, etc. In Gene J. Galletta and David G. Himelrick, Eds. Small Fruit Crop Management. Englewood Cliffs, NJ: Prentice Hall. pp. 363-381, 363-370.

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Cost of OFM Management in Peaches - Conventional Versus Mating Disruption
Source: Neil Carter - Tender Fruit and Grape IPM Specialist/Ontario Ministry of Agriculture, Food and Rural Affairs, Volume 5, Issue 28, November 23, 2005

During the summer of 2005, I ran a demonstration project using the oriental fruit moth (OFM) mating disruption (MD) product from BASF called "RAK 5 OFM". This project involved 3 sites, each with 3 comparisons of OFM management using: (1) season-long MD, (2) MD plus first generation insecticide, and (3) conventional insecticide programs.

BASF RAK 5 OFM dispenser

RAK 5 OFM performed well with most MD sites having equivalent or less shoot flagging and fruit damage than conventionally managed orchards. In order to focus on the relative cost of MD versus
insecticides, I will give only a few notes on the actual performance of RAK 5 OFM. Anyone interested in all the details can contact me for a copy of the full report.

_ RAK 5 OFM were "installed" at a rate of 2.5 acres/person/hour (about $4/acre labor cost)

_ Shoot flagging checks after first generation showed two "stand-alone" MD sites to be virtually untouched by OFM but the third site had 2.0% flagging - too much for comfort early in the summer and obviously a high pressure site. This one reverted to standard insecticides for the remainder of the season with no crop loss.

_ Two RAK 5 OFM MD sites had no insecticides for OFM all year and there was no difference in OFM or other insect damage between these sites and the other 3 MD sites and 3 comparison conventional blocks.

_ No additional secondary pest damage was noted in the MD orchards.

_ No "extra" monitoring was needed at MD sites except for shoot flagging checks

_ There was very little fruit damage by OFM in any of the treatments. Season-long MD for OFM can provide control equivalent to conventional practices.

_ Few late season peaches were examined in this project. Further research should determine if late season (Loring and beyond) peaches need pre-pick sprays if using MD.

Economic Considerations

Depending on the harvest date of different varieties, protection of peaches from OFM using standard pesticide recommendations requires 1 application of Lorsban and 2 to 5 applications of pyrethroids.

Table 1 shows the approximate average cost of a pesticide program to manage OFM in peaches. In order to keep the economic analysis simple, the average product cost of four common pyrethroids (Decis (deltamethrin), Ripcord (cypermethrin), Matador (cyhalothrin-lambda), and Pounce (permethrin)) was estimated at $8.50/acre.

Table 1. Approximate product costs per acre of an OFM insecticide program in peaches

Applications	2 pyr'd	3 pyr'd	4 pyr'd	5 pyrethroid
Pyrethroids	$17	$25.50	$34	$42.50
Lorsban	$48	$48	$48	$48

Lorsban + 2 to5 pyrethroids
$65 $73.50 $82 $90.50

Table 2. Approximate product costs for OFM management in peaches for different season varieties and comparison to MD

Harvest Season	Insecticide Requirements	Approximate insecticide cost $/acre	Approx. insecticide cost plus one application cost
Early (before Aug 8	Lorsban + 2 to 3 pyrethroids	$65 to $73.50	$90 to $98.50
Mid (Aug 8 to 31)	Lorsban + 3 to 4 pyrethroids	$73.50 to $82	$98.50 to $107
Late (after Sept. 1)	Lorsban + 4 to 5 pyrethroids	$82 to $90.50	$107 to $115.50
All Season	Mating disruption	Approximately $100	n/a

RAK 5 OFM MD provided equivalent control of OFM to standard insecticides. Therefore, growers could expect to save $65 to $90.50 in OFM insecticide costs alone if using a season-long MD program for OFM. In addition, growers may save one spray trip through the orchard (most of the time but not always, a fungicide application is necessary at the same timing as an OFM insecticide; also, many prefer to apply Lorsban by itself). A value of $25/acre is used above for an application cost including depreciation, interest on investment, labour, fuel, maintenance, etc. for both the tractor and sprayer (OMAFRA Cost of Production for Tender Fruit, Publication 817, plus inflation). The potential savings from less application trips through the orchard is an important component of the total savings from using MD, but it is unpredictable. In some years, growers using MD would have to make just as many application trips because of the need for sufficient fungicide coverage. In other years, there may be significant savings in reduced spray events when using MD.

As BASF RAK 5 OFM dispensers are not yet registered for use in Canada, the actual cost of a season-long program is an estimate. Other OFM MD products are on the market (Isomate Rosso and Isomate M100 "twist tie"-type dispensers) with the approximate cost of $100/acre.

Additional potential benefits not considered in this simple economic analysis include: reduced chance of developing OFM resistance to pyrethroids; reduced red mite populations in MD orchards; no re-entry intervals for MD products; and no problems scheduling irrigation or other sprays. These comments also apply to other OFM MD products on the market.

Information helpful in planning an MD program for OFM in peaches is in the OMAFRA factsheets Mating disruption for management of insect pests, Order No. 03-079 and Mating disruption for management of oriental fruit moth in stone fruit and pome fruit, Order No. 04-029.

Related Links

_ Mating Disruption for Management of Insect Pests, OMAFRA Factsheet Order No. 03-079

_ Mating Disruption for Management of Oriental Fruit Moth in Stone Fruit and Pome Fruit, OMAFRA Factsheet Order No. 04-029

For more information: Toll Free: 1-877-424-1300, Local: (519) 826-4047 , Email: ag.info@omaf.gov.on.ca

Terminal Market Wholesale Fruit Prices December 8, 2005

Chicago: <http://www.ams.usda.gov/mnreports/HX_FV010.txt>
Apples: Market about steady.

Cartons tray pack MI U.S.
Fcy Jonathan 100s 17.00

Cartons cell pack NY U.S. ExFcy Mcintosh 80s 27.00 96s 27.00

Cartons 12 3-lb film bags MI U.S. ExFcy Red Delicious 2 1/2" min 13.50
Golden Delicious 2 1/2" min 13.50
Gala 2 1/2" min 15.00
Mcintosh 2 1/2" min 13.50
Jonathan 2 1/2" min 13.00-13.50 some 14.00 2 1/4" min 12.00

Bushel cartons loose IL Red Delicious 2 1/4" min 12.00
MI U.S. One Golden Delicious 2 1/4" min 12.00-13.00
Jonagold 2 1/4" min 12.00-13.00
Paula Red 2 1/4" min 12.00-13.00

Detroit: <http://www.ams.usda.gov/mnreports/DU_FV010.txt>
Apples: no market trend listed

Cartons tray pack MI
U.S. ExFcy Red Delicious 113s 15.75 138s 15.75
Mcintosh 88s 23.00-23.50 100s 23.00-24.50
Empire 100s 23.00-24.50

Cartons cell pack NY U.S. ExFcy Mcintosh 100s 23.50-24.00

Cartons 12 3-lb film bags MI U.S. ExFcy Red Delicious 2 1/2" min 12.00-14.50 mostly 12.00-13.50 few best 18.00-18.50
Golden Delicious 2 1/2" min 12.00-13.50 few 14.00-14.50 Fuji 2 1/2" min 13.00-13.50 few best 18.00-18.50
Gala 2 1/2" min 17.00-17.50 2 1/4" min 15.00-15.50
Red Rome 2 1/2" min few 14.00-14.50
Mcintosh 2 1/2" min 12.00-13.50 some best 16.50-18.50
Jonathan 2 1/2" min 13.00-13.50 few 14.00-15.50
Empire 2 1/2" min 12.00-13.50 few best 18.00-18.50
Idared 2 1/2" min 13.50-14.50

MI U.S. Fcy Red Delicious 2 1/4" min 10.00-10.50
Golden Delicious 2 1/4" min 10.00-10.50
Gala 2 1/4" min 10.00-10.50
Mcintosh 2 1/4" min 10.00-10.50
Jonathan 2 1/4" min 10.00-10.50

Bushel cartons loose MI No Grade Marks Red Delicious 2 3/4" up 12.00-13.00 3" min 12.00-13.00 few best 14.00-14.50
Golden Delicious 2 3/4" up 12.00-13.00 3" min 12.00-13.00 few best 14.00-14.50
Granny Smith 3" min 12.00-13.00
Empire 2 3/4" up 12.00-13.00 3" min 12.00-13.00

Pittsburgh: <http://www.ams.usda.gov/mnreports/PS_FV010.txt>
Apples: Market about steady.

Cartons tray pack NY U.S. Fcy Empire 125s 14.50 138s 11.50
PA U.S. ExFcy Red Stayman 88s 24.00

Cartons cell pack NY Comb U.S. ExFcy-U.S. Fcy Mcintosh 100s 26.00
U.S. Fcy Mcintosh 80s 17.50 100s 17.50

Cartons 12 3-lb film bags PA U.S. ExFcy Rome 2 1/2" up 14.75