



# Newsletter

Extension

## Fruit ICM News

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## Calendar

**September 16-18: Farm Science Review**, Molly Caren Agricultural Center, London, Ohio. See 2,100 acres showcasing a dynamic Ohio agricultural industry. For information contact Craig Fendrick, 614-292-4278 or email at [fendrick.1@osu.edu](mailto:fendrick.1@osu.edu). Web site: <http://fsr.osu.edu/>

## Treat Peach Leaf Curl in the Fall

*Source: Mark Longstroth, District Extension Horticultural & Marketing Agent, MSU Fruit CAT Vol. 18, No. 17, September 9, 2003*

Peach leaf curl can be an important disease in Michigan (and the Midwest) and can defoliate peach and nectarine trees. Infections take place in the spring as the buds open. The fungus infects peach buds from bud swell to bud opening under wet conditions. Early spring fungicide applications effectively control this disease, but many growers have trouble getting treatments on before bud break. The prolonged cool, wet periods during bud burst that cause infection also limit growers' ability to spray in a timely fashion.

If you had problems with peach leaf curl this season, you can treat the disease in the fall. The best timing for application is during leaf fall. The longer you wait the better. You need good coverage of the buds exposed when the leaves fall off. This means that the best time to spray is after the first frost. This is especially true with young trees, which hold on to their leaves until the really cold weather comes in late November. Young trees just coming into bearing often surprise growers when they have peach leaf curl in the spring. It takes several years for the disease to colonize new plantings, and the disease organism lives harmlessly on the outside of the tree during the growing season. By the time the grower sees that they have a problem, it is too late to do anything about it. Effective controls include Bravo, Ziram, Ferbam (Carbamate) and copper compounds. If you treat for peach leaf curl in the fall, that will be one less thing you need to remember in the busy spring season.

# Use of MCP (SmartFresh™) on Apples

Source: Randy Beaudry, MSU Horticulture, MSU Fruit CAT Vol. 18, No. 17, September 9, 2003

## Background

The growth regulator, 1-methylcyclopropene (MCP), has been shown to have significant promise as an ethylene action inhibitor. MCP was approved for application to edible crops July 2002 and is currently labeled for use on apple. The commercial name for MCP on horticultural crops other than ornamentals is *SmartFresh™*

With apples, a single exposure to MCP can temporarily render the fruit insensitive to ethylene. MCP delays the onset of the rise in ethylene production and similarly delays the rise in respiration, aroma production, and softening. A single postharvest application can prevent ripening for an extended period (greater than 30 days) at ambient (75°F) temperature relative to non-treated controls. MCP also dramatically inhibits aroma production in apple and can reduce the incidence of a common disorder called superficial scald.

The response of apple fruit (and ethylene sensitive floral crops) to MCP depends upon a number of variables. These variables include application technique, the exposure environment, the storage environment (if different from the exposure environment), cultivar sensitivity, and the physiological status of the crop. Control of these variables will be needed to achieve a consistent response from MCP, regardless of the crops being treated.

## Response variables

Application technique refers to the concentration, duration, and frequency of application. MCP concentrations required to saturate binding sites, and the extent and longevity of MCP action, are influenced greatly by species, organ, tissue, and mode of ethylene biosynthesis induction. A "time x concentration" effect is apparent, and the longer the exposure, the lower the required concentration.

Although MCP binding is thought to be essentially irreversible, inhibition of ethylene action may be overcome by the production of new receptor sites. For apple, it appears that the concentration of MCP needed to be effective is between 0.25 and 1 ppm in the airspace around the fruit. The time needed for effective treatment appears to be relatively short and is between 12 and 16 hours at 32 to 68F. It is thought that the treatment time needed to achieve maximum benefits decreases as treatment temperature increases.

Repeated treatment of apple fruit with MCP can improve the effectiveness of the material, especially at elevated temperatures. A weekly application of MCP prevented the softening of 'Redchief Delicious' apple fruit for over 120 days at 68F. However, decay, while reduced relative to untreated fruit, is not inhibited by MCP and can be a significant problem for fruit held at elevated temperatures.

The physiological status of the apple fruit is affected by a number of environmental, chemical, and physiological factors. It appears that apple fruit tend to respond best when they are treated early in the ripening process in much the same way that less mature fruit tend to respond more favorably to controlled atmosphere storage (CA) application relative to more mature fruit. There is some evidence to suggest that the elevated levels of ethylene found during ripening in some fruit varieties, such as 'McIntosh,' may be sufficient to reduce the effectiveness of MCP. Therefore, those factors that enable treatment of the fruit with MCP at an earlier stage of development should improve or enhance the response of the fruit.

If fruit are held in storage for a period prior to application of MCP, the effectiveness of the gas declines. This is likely due to the fact that the fruit are at a relatively advanced stage of ripening at the time of MCP application. However, depending on variety, fruit may still respond to MCP even after several months if they are maintained in a relatively young condition by CA storage.

The storage environment influences the physiology of the apple fruit and so too affects the response to MCP. As temperature increases, the duration of the effectiveness of a single pre-storage application of MCP declines. Ripening is delayed by roughly 30 to 40 days at room temperature; the delay in ripening can be more than 100 to 200 days at 32F.

Physiological disorders of apple fruit (superficial scald, soft scald, coreflush, greasiness, and senescent breakdown) can be reduced by MCP application. MCP application has also been associated with the development of some forms of superficial lesions or disorders occasionally on some apple fruit cultivars. One concern is reports of increased susceptibility of MCP-treated fruit to carbon dioxide injury.

Beneficial or detrimental effects of MCP presumably depend on whether ethylene production, and associated ripening and senescence, is required for disorder development, e.g. scald and senescent breakdown, or whether normal ripening is required to prevent disorder development.

### **Factors to consider prior to use**

Ethylene is a natural hormone for the plant and, like other hormones, is required for, or participates in, a number of physiological processes. Apart from inducing ripening-related changes in flavor and texture in climacteric crops such as apple, ethylene is known to play a role in pigment formation, chlorophyll degradation, decay resistance, leaf/flower abscission, phenolic metabolism, and other processes in many tissues.

While some aspects of ripening are nearly completely arrested by timely MCP application, others not under complete control of ethylene may continue to change. The effect of MCP on ripening parameters such as starch degradation, sugar accumulation, and preservation of titratable acidity, is not as dramatic as its effect on firmness. This may have important implications on fruit quality. In the case of apple, acidity contributes a significant portion of taste quality. It is therefore possible that MCP treated fruit, despite their firmness, may not maintain the tartness (taste) typical of some cultivars after extended storage.

The impact of MCP on aroma has been measured. The compound induces a profound reduction in aroma production at concentrations greater than 1 ppm. Application of MCP immediately after harvest delays the recovery of the capacity to produce aromas. 'Jonagold' and 'Red Delicious' fruit treated with MCP after harvest required almost two months at room temperature to develop a normal complement of aromas, whereas non-treated fruit required only about a week. The time to recovery of volatile production declined as the duration of refrigerated storage increased. MCP-treated fruit were producing low amounts of aromas immediately after removal from refrigerated storage after five to six months storage.

Decay has not been shown to increase in response to MCP, but when MCP-treated fruit are held at elevated temperature, an unacceptable level of decay can result. While there is no published literature that suggests that apple fruit in particular may be more susceptible to decay in response to the suppression of ethylene action by MCP, other plant species have exhibited increased susceptibility to some disease and decay causing pathogens. Some caution with regard to decay prevention is probably warranted even at the low temperatures of typical air or CA storage.

The advent of MCP as a commercial tool has tremendous potential to help fruit industries maintain fruit quality. While we have one year of use here in Michigan under our belts, much remains to be learned

regarding fruit physiological responses, potential pitfalls and optimized financial gain.

## Multicolored Asian Lady Beetles

Source: Doug Landis and Rufus Isaacs, *MSU Entomology, MSU Fruit CAT Vol. 18, No. 17, September 9, 2003*

Soybean fields in Michigan (and Ohio) have experienced high populations of soybean aphids this year, attracting lots of lady beetle predators. With such a highly abundant food source, multicolored Asian lady beetle populations may be high this fall. In addition to its beneficial aspects as an aphid predator, the multicolored Asian lady beetle also has the potential to cause damage to ripe fruit, enter homes, and occasionally bite people. MSU has prepared a website dealing exclusively with the multicolored Asian lady beetle. For more information on this good bug with some bad habits, visit:

<http://www.ipm.msu.edu/asianladybeetle.htm>.

## Degree Day Accumulations for Ohio Sites September 10, 2003

Ohio Location	Degree Day Accumulations			
	Base 45° F		Base 50° F	
	Actual	Normal	Actual	Normal
Akron/Canton	3167	3251	2358	2492
Cincinnati	3740	4073	2892	3200
Cleveland	3271	3200	2483	2431
Columbus	3626	3585	2787	2768
Dayton	3474	3669	2645	2850
Kingsville	2823	2997	2070	2262
Mansfield	3012	3225	2211	2448
Norwalk	3152	3180	2360	2418
Piketon*	3780	3971	2819	3102
Toledo	3164	3170	2379	2411
Wooster	3283	3062	2463	2293
Youngstown	2877	3001	2087	2241

\* Piketon data partially missing, Jackson data substituted

## Fruit Observations & Trap Reports

**Insect Key**

AM: apple maggot  
CM: codling moth  
ESBM: eye-spotted budmoth  
LAW: lesser apple worm  
LPTB: lesser peachtree borer  
OBLR: obliquebanded leafroller  
OFM: oriental fruit moth  
PTB: peachtree borer  
RBLR: redbanded leafroller  
SJS: San Jose scale  
STLM: spotted tentiform leafminer  
TABM: tufted apple budmoth  
VLR: variegated leafroller

**Site: Waterman Lab, Columbus**

Dr. Celeste Welty, OSU Extension Entomologist

**Apple:** 9/3 to 9/10/03

AM: 0.0 (same as last week)  
CM: 5.7 (down from 9.3)  
ESBM: 0 (same as last week)  
LAW: 4 (up from 2)  
OBLR: 0 (same as last week)  
RBLR: 13 (down from 35)  
SJS: 116 (up from 12)  
STLM: 1160: (up from 347)  
TABM: 0 (same as last week)  
VLR: 0 (down from 7)

**Peach:** 9/3 to 9/10/03

OFM: 0 (same as last week)  
LPTB: 0 (same as last week)  
PTB: 2 (up from 1)

**Site: West District: Sandusky County - Ted Gastier, Huron County Agent****Apple:** 9/1 to 9/5/03

AM: 0.0 (down from 1.0)  
CM: 1.3 (down from 3.8)  
LAW: 0.5 (down from 3.3)  
OFM: 8.9 (down from 25.8)  
RBLR: 10.3 (down from 45.0)  
SJS: 0.0 (down from 13)  
STLM: 0.0 (down from 10.0)

Other apple pests: eyespotted bud moth

Beneficials: green lacewing, syrphid flies (white maggot adults), and brown lacewing

Beneficials with bad habits: multi-colored Asian ladybeetle

**Peach:** 9/1 to 9/5/03

LPTB: 2.5 (down from 3.8)

OFM: 0.0 (down from 1.1)

PTB: 0.0 (down from 0.5)

RBLR: 3.3 (down from 6.0)

Beneficials: green lacewing, syrphid flies (white maggot adults), and brown lacewing

Beneficials with bad habits: multi-colored Asian ladybeetle

## Terminal Market Wholesale Fruit Prices September 10, 2003

Source: Chicago [http://www.ams.usda.gov/mnreports/HX\\_FV010.txt](http://www.ams.usda.gov/mnreports/HX_FV010.txt)

Detroit [http://www.ams.usda.gov/mnreports/DU\\_FV010.txt](http://www.ams.usda.gov/mnreports/DU_FV010.txt)

Pittsburgh [http://www.ams.usda.gov/mnreports/PS\\_FV010.txt](http://www.ams.usda.gov/mnreports/PS_FV010.txt)

	Chicago	Detroit	Pittsburgh
<b>Apples, Ctns celpk</b> U.S. ExFcy Tydeman Red		NY 100s 24.00 120s 21.00	NY ctns trypk U.S. One Paula Red 100s 18.75-19.50
<b>Apples, 3-lb filmbags,</b> U.S. ExFcy Earligold		MI 2 ½" min 13-13.50	WV ctns trypk U.S. ExFcy Ginger Gold 72s 17.25 80s 16.25 88s 15.50
U.S. ExFcy Early McIntosh		MI 2 ½" min 13-14.50	NY ctns celpk U.S. ExFcy Jersey Mac 100s 25- 25.50 U.S. One Jersey Mac 19.50 Ctns 12 3-bag filmbags
U.S. ExFcy Ginger Gold		MI 2 ½" min 12-13.00	NY U.S. ExFcy Jersey Mac 2 ½" min 15.00-16.00
U.S. ExFcy Paula Red		MI 2 ½" min 12-13.50	PA no grade/no size marks Ginger Gold 8.00- 9.00
U.S. Fancy Paula Red		MI 2 ½" min 13-13.50	
<b>Apples, bu cartons, U.S. Fcy</b> Gala U.S. Fcy Ginger Gold U.S. Paula Red		MI 2 ¾" up 15.00 2 ¾" up 12-15.00 2 ¾" up 12-15.00 3" min 14-15.00 2 ½" up 12.00 2 ¼" up 10.00	

<b>Blueberries</b> , 12 1-pt cups	<b>MI</b> lg 25.00-26.00	<b>MI</b> med-lg 25-25.50 med 22.00-24.00	<b>MI</b> 12 6-oz cups 20.00
<b>Nectarines</b> , 2-layer trypk U.S. Fcy Various Yellow Flesh varieties ½ bu. lse, U.S. One var. yel. flesh		<b>PA</b> 48s 17.00-18.50 marked tree-ripe 15.00 <b>MI</b> 2½" up 13.50-15.00	<b>NJ</b> Sunglo 2 ¼" up 12.75
<b>Peaches</b> , 25 lb cartons, loose U.S. ExOne, var. yel. flesh	<b>MI</b> 2 ¾" up 13-14.00		
<b>Peaches</b> , 25 lb cartons, various yellow flesh varieties	<b>WV</b> 2 ½" up 10.00 2 ¼" up 8.00		
<b>Peaches</b> , ½ bu ctns, U.S. One various yellow flesh varieties		<b>MI</b> 2 ¾" up 11-15.00 2 ½" up 9-13.50 2 ¼" up 9-10.00	<b>NJ</b> U.S. ExOne Flavorcrest 2 ¾" & 2 ½" up 12.00 White Rose 2 ¾" up 10-11.00 <b>WV</b> U.S. ExOne Redglobe 2 ¾" up 10-13, 2 ½" up 9.50
<b>Peaches</b> , ½ bu ctns, no grade mark, various yellow flesh varieties Various white flesh varieties		<b>NJ</b> 2 ¾" up 8.00-10.00 2 ½" up 6.00-8.00 2 ¼" up 4.00-5.00 <b>NJ</b> 2 ¼" up 5.00	<b>NJ</b> Flavorcrest no size mark 7-8.00
<b>Prune Plums</b> , 30 lb ctns U.S. One Stanley		<b>MI</b> 1 ¼" min 12-15.00	<b>MI</b> 1¼" min 14.00

The intent of listing terminal market prices is to provide information available in the public domain. It is not intended for price setting, only to assist growers in evaluating the value of their crops. Producers need to remember that the prices listed are gross, and consideration must be given to marketing costs, including commission, handling charge, gate fees, and possible lumper fees.

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Information presented above and where trade names are used, they are supplied with the understanding that no discrimination is intended and no endorsement by Ohio State University Extension is implied. Although every attempt is made to produce information that is complete, timely, and accurate, the pesticide user bears responsibility of consulting the pesticide label and

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