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Kentucky Fruit Facts

July 2002 (7-02)
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Fruit Facts can be found on the web at: http://www.ca.uky.edu/HLA/fruifact/

Fruit Crop Status and News

Peach, summer apple, thornless blackberry, and fall bearing raspberry harvest are well underway and we have finished or are on the home stretch of the blueberry harvest season. The dry weather has helped to increase fruit sugar contents and eating quality has been excellent.

Some peach growers have noticed a little more scab than usual due to our rainy spring, while some apple growers are not having any trouble finding mites. This is also the season for Japanese and Green June beetles which have been quite severe in some areas. Our threshold for sooty blotch and flyspeck disease infection on apples was reached the week of July 8th here in Lexington. Some grape growers have had more than their share of black rot where there were lapses in spray programs. Grape growers should be watching and spraying for downy and powdery mildew.

Growers should not let fruit plants get too dry, because for many fruit crops this is the period of flower bud initiation for next seasons crop. Water is also important for fruit size. Keep new plantings well watered and weeds under control to maximize growth.

Please note that there is a **compatibility problem between the new insecticide Danitol and the fungicide Ziram**. Both of these are labeled for apple, pear and grape production.

We are very pleased to welcome Dr. Joe Masabni and his family to Kentucky. Joe is our new extension Fruit and Vegetable Specialist at the Princeton Research and Education Center and began work July 1. (John Strang)

Upcoming Meetings

Aug. 5 - Woodford County Farm Tour - Will include a roundtable discussion on commercial blackberry, raspberry and blueberry production. Contact Patti Meads 859/873-4601.

Aug. 15 - Nutrition and Food Preservation - Third Thursday Program, Kentucky State University Research Farm, 1525 Mills Lane, Frankfort, KY, 10 a.m.-3 p.m. Contact 502/597-6437, e-mail msimon@gwmail.kysu.edu

Aug. 15 - Commercial Vineyard Establishment and Grape Production Field Day, Dumont Gouge farm near Walton, KY. 5:00 p.m. Speakers will include John Strang, Joe Masabni, Ric Bessin and Chris Smigell. Contact Boone County Extension office 859/586-6101.

Sept. 19 - Pawpaws and Related New Crops - **Third Thursday Program**, Kentucky State University Research Farm, 1525 Mills Lane, Frankfort, KY, 10 a.m.-3 p.m. Contact 502/597-6437, e-mail msimon@gwmail.kysu.edu

Oct. 26 - Fall Kentucky Nut Growers Association meeting, Joe Ballard's, Owensboro, KY.

Nov. 21 - Certified Kitchens - **Third Thursday Program**, Kentucky State University Research Farm, 1525 Mills Lane, Frankfort, KY, 10 a.m.-3 p.m. Contact 502/597-6437, e-mail msimon@gwmail.kysu.edu

Jan. 6-7, 2003 Kentucky Annual Fruit and Vegetable Grower Conference and Trade Show, Holiday Inn North, Lexington, KY. Contact John Strang 859/257-5685

Dr. Joseph G. Masabni Begins Fruit and Vegetable Extension Position at the U. K. Research & Education Center

As I start my first year as the newest faculty member in the department of Horticulture, University of Kentucky, I would like to introduce myself to all readers of Fruit Facts. I was hired as a Fruit and Vegetable Extension Specialist at the UKREC station located at Princeton, KY.

I am originally from Lebanon where I started my undergraduate education at the American University of Beirut. In 1984, I came to Michigan State University to complete my bachelor's degree. I am married to a beautiful Lebanese girl (Marie) and together we have two children: a 6 year old girl named Julianna, and a 3 year-old boy named Jonathan.

I received all 3 diplomas from Michigan State University in the department of Horticulture.

My Master's degree dissertation dealt with the "Effects of Benzyl Adenine and Hand Thinning on Harvest Size of Starkrimson Delicious Apple" under the supervision of Dr. Frank G. Dennis. My Ph.D. thesis dealt with "Linuron Resistance in a New Biotype of Common Purslane". I pursued my Ph.D. during my employment with Dr. Bernard Zandstra, Vegetable Extension Specialist at Michigan State University.

My 12 years of work experience as Research Assistant with Dr. Zandstra taught me a lot about weed control in vegetables, fruit trees, small fruit crops, and some ornamentals.

As you can see, my education is broad and covered research on fruits and vegetables. My work experience dealt mainly with weed control, but I learned a lot about vegetable production under the tutelage of Dr. Bernard Zandstra.

I was hired to replace the position vacated by Dr. Jerry Brown after his retirement, and am looking forward to try and fill the big shoes he left behind. My official duties are 85% extension and 15% research. The extension portion of my duties include both fruit and vegetables and the research aspect includes the NC-140 project among others.

As a new faculty member, I would like to be of help to all growers, farmers, extension agents, co-op managers, among others. I am very happy to be a member of the extension faculty and staff, and would like the opportunity to meet and work with all of you sooner or later.

Please feel free to contact me at the U.K. Research and Education Center, 1205 Hopkinsville St., P.O. Box 469, Princeton, KY 42445-0469, phone 270/365-7541 ext. 247 or e-mail jmasabni@uky.edu

Understanding Spray Rates for Fruit Trees

Ric Bessin, UK Entomology Department

I continue to get questions about which pesticide spray rates to choose in our tree fruit spray guide, the per 100 gallons rate or the per acre rate. The per acre rates are generally 2.5 to 4 times higher than the per 100 gallon rates. The answer is that the two types of rates are interchangeable. The per acre rate represents the maximum amount of material that growers are permitted to spray per acre with a single application. The per 100 gallon rate represents the concentration used with a dilute spray. A dilute application is the minimum gallonage needed for complete coverage and cause the trees to drip after application. This dilute gallonage varies depending on the types of tree structure. When apples were grown on standard rootstocks, 400 gallons were needed for a dilute application. With dwarfing rootstocks and high density plantings, dilute gallonage may drop to as low as 120 to 150 gallons per acre. With these reduced gallonages to obtain complete coverage, many growers find it easier to work with the per 100 gallon rates.

Once you understand the gallonage needed for a dilute application, then it straight forward to determine the amount of pesticide required. For example, if the orchard needs 150 gallons for a dilute application and complete coverage, then the grower needs to multiply the rate per 100 gallons by 1.5. This is considerable less than the per acre rate. This is the amount of pesticide that is applied per acre.

To add to the complexity of this, many growers concentrate their sprays and do not apply their pesticide sprays to runoff. They may only use 50 to 80 gallons of spray per acre. They use the correct amount of pesticide as if they are applying a dilute spray, but just use less water.

Yield Assessment and Adjustment in Grapes

Bruce Bordelon, Extension Viticulturist, 1999. Facts for Fancy Fruit newsletter, Purdue University

Grapes require careful control of crop size to balance the amount of fruit to vegetative growth. An optimum balance leads to maximum yields of high quality fruit and adequate vine growth for consistent productivity. Excess fruit production leads to poor fruit quality and reduced vegetative growth, resulting in lower potential production in the future. Though crop control is generally accomplished through balanced pruning, many French hybrid cultivars tend to be overly productive, so balanced pruning alone will not adequately control crop size. These cultivars require careful crop load adjustment to prevent weakening of the vines.

The potential yield must be estimated to determine if crop reduction is necessary. Potential yield is determined by the number of vines per acre (based on row and vine spacing), the number of clusters per vine, and the weight of the mature clusters. At standard spacing (8' x 10') there are approximately 545 vines per acre. If each vine produced 20 lb of fruit, the yield on a per acre basis would be 10,900 lb., or about 5 ½ tons. To determine how much fruit a vine will yield, count the number of clusters and estimate the cluster weight based on cultivar and past performance of the vineyard. Multiply average cluster weight by number of clusters, then by number of vines to determine yields per acre. Cluster size is largely determined by genetics of the cultivar and is relatively consistent from year to year, however, factors that affect fruit set can have an effect on cluster weight. We have been taking data on yield, cluster weights, berry weights, etc. for the past three seasons and are beginning to get a good idea of performance of many grape cultivars. In our trials, large clusters average about 1/3 to ½ lb. But can be much larger. Large clustered cultivars include: Seyval, Vidal, Chardonel, Cayuga White, Villard Blanc, and seedless cultivars such as Reliance, Marquis, and Himrod when cluster-thinned. Medium clusters average about 1/4 lb. and occur on cultivars such as Chambourcin, Chancellor, Horizon, LaCrosse, Melody, Traminette, Concord, Niagara, and Catawba. Small clusters average about 1/5 to 1/8 lb. and occur on Cynthiana/Norton, Foch, Leon Millot, Delaware, Baco noir, Ventura, and Vignoles.

Yields from 5 to 7 tons per acre are reasonable for most wine grape cultivars in moderately vigorous vineyards, though actual yields range from less than one ton to well over 10 tons per acre depending on cultivar and vine vigor. Growers must know the relative vigor of their vines (pruning weights) and past performance of the vineyard to determine the maximum yield potential. A good rule of thumb is that the 'crop load' (ratio of yield to pruning weight) should be in the range of 7 to 15 for French hybrid and American cultivars. It is easy to overcrop grapes if careful attention is not paid to crop load. Set a target yield based on past experience and adjust the crop to meet that target. Keep good records to determine the appropriate yields for each particular vineyard block.

To adjust the crop load, first adjust shoot number. Adjust shoot density to approximately six shoots per foot of row on a single curtain system (48 shoots/vine at 8 ft. spacing). An excessive number of shoots can create a shading problem that reduces fruit quality and bud fruitfulness for next year. Remove secondary and non-count shoots before primary shoots. After shoots are thinned to the proper density, estimate the yield by counting the clusters on the remaining shoots. To further reduce the crop, thin to one or two clusters per shoot depending on cluster size and number per shoot. Leave the basal cluster as it is (usually the largest). Shoot removal should be completed relatively early in the season to reduce vine stress, but cluster thinning can continue up through veraison if necessary.

Blackberry Rosette (Double Blossom) is Appearing

John Hartman, UK Plant Pathology Department

Rosette disease, caused by the fungus *Cercosporella rubi*, has been found over the last two months on blackberries in the field. Infected flowers have distorted petals, giving the appearance of a double flower (hence double blossom). Unopened flower buds may be abnormally large and coarse and frequently somewhat redder. Flower petals and sepals may enlarge and become leaf-like. The fungus produces a whitish spore mass that can cover the surface of infected flower pistils and stamens. In addition, shoots may appear abnormal with leafy proliferation (rosette) or witches broom. Several witches brooms may be formed on one cane. The foliage of witches brooms may be paler green than normal and eventually turn a bronze color. Berries do not develop from infected branches and other parts of the cane may produce only small, poor quality fruit. Thus, this loss of yield and quality should concern growers.

When the disease is established, the buds of new canes become infected from fungal spores produced on infected distorted flowers of old canes. Blackberries can become infected from spores produced on wild blackberries nearby and carried to the blackberry planting by wind or insects. After infection in summer, new canes may remain symptomless until the next year. The fungus overwinters in infected buds. Blackberry nursery stock can harbor the causal fungus in rooted plants, but not

in root pieces, which are commonly sold for blackberry propagation. Dr. Terry Jones, Horticultural Specialist at the Robinson Station at Quicksand, demonstrated this some years ago by successfully growing disease-free blackberries from root pieces taken from infected plants while at the same time observing disease development on the same plant source transplanted as rooted plants.

Control. Select a site isolated from wild blackberries or other brambles. In many parts of Kentucky, this may be difficult. Use disease-free nursery stock, roots only. If the disease is not already severe, infected rosettes and blossom clusters should be removed and destroyed before they produce spores. Old canes should be removed and destroyed immediately after harvest. Remove and destroy wild blackberries and other brambles near the planting.

If the disease is serious, more drastic action may be needed. The fungicide Benlate can be used up to 5 times in a season beginning at first bloom and extending through harvest. This fungicide will no longer be available after this year. It is hoped that other fungicides will emerge as substitutes for Benlate before next year. Some growers control this disease by harvesting blackberries in alternate years and destroying the above-ground parts of both the new and old canes in spring every other year. Splitting the planting into two fields allows harvest every year with biennial cropping on each half.

Grape Downy Mildew

John Hartman, UK Plant Pathology Department

This season is shaping up to be a grape disease-favorable year. Unprotected grapes are already heavily infected with black rot disease. Now downy mildew is also appearing in some vineyards. Downy mildew can be a major disease of grapes in Kentucky. The fungus causes direct yield losses by rotting inflorescences, clusters and shoots. Indirect losses can result from premature defoliation of vines due to leaf infections. Premature defoliation is a serious problem because it predisposes the vine to winter injury. In general, vinifera (*Vitis vinifera*) varieties are much more susceptible than American types and the French hybrids are somewhat intermediate in susceptibility.

Disease cycle and symptoms. The downy mildew causal fungus, *Plasmopara viticola,* overwinters as tiny oospores in leaf debris on the vineyard floor. In the spring, the oospores serve as primary inoculum and germinate in water to form sporangia. The sporangia liberate small swimming spores, called zoospores, when free water is present. The zoospores are disseminated by rain splash to grape leaves, stems, and flowers where they swim to the vicinity of stomata and encyst. Encysted zoospores infect grape tissues by forming germ tubes that enter stomata and from there invade inner tissues of the plant. The fungus can infect all green, actively growing parts of the vine that have mature, functional stomata.

Infected leaves develop yellowish-green lesions on their upper surfaces 7 to 12 days after infection. As lesions expand, the affected areas turn brown, necrotic or mottled. At night, during periods of high humidity and temperatures above 55°F, the fungus forms sporangia on branched sporangiophores, that protrude out through stomata on the underside of the leaf. Because leaf undersides contain high numbers of stomata, sporulation is dense and it gives the surface of the lesion its characteristic white, downy appearance. Sporangia are disseminated by wind or rain splash and on susceptible tissue they liberate zoospores into water films formed by rain or dew. These zoospores initiate secondary infections which can occur in 2-9 hours depending on temperature. Infections are usually visible as lesions in about 7 to 12 days, depending on temperature and humidity. The number of secondary infection cycles depends on the frequency of suitable wetting periods that occur during the growing season and the presence of susceptible grape tissue. In general, Catawba, Chancellor, Chardonnay, Delaware, Fredonia, Ives, Niagara, White Riesling, and Rougeon are highly susceptible cultivars.

Severely infected leaves may curl and drop from the vine. The disease attacks older leaves in late summer and autumn, producing a mosaic of small, angular, yellow to red-brown spots on the upper leaf surface. Lesions commonly form along leaf veins and the fungus sporulates in these areas on the lower leaf surface. When young shoots, petioles, tendrils, or cluster stems are infected, they frequently become distorted, thickened, or curled. White, downy sporulation can be abundant on the surface of infected areas. Eventually, severely infected portions of the vine wither and die. Infected green fruit turn light brown to purple, shrivel, and detach easily. White, cottony sporulation is abundant on these berries during humid weather. The fruits remain susceptible as long as stomata on their surfaces are functional. After that, new infections and sporulation do not develop, but the fungus continues to grow into healthy berry tissue from previously infected areas. Later in the season, infected berries turn dull green to reddish purple, remain firm, and are easily distinguished from non-infected ripening berries in a cluster. Infected berries are easily detached from their pedicels leaving a dry stem scar.

Disease management. The first fungicide applications may be needed during the period between bud break and bloom and the last ones may

be needed after harvest to prevent defoliation. There are many different kinds of fungicides effective against this disease. Especially on highly susceptible cultivars, the early season fungicide program should contain a fungicide that has efficacy against downy mildew. For more information on managing downy mildew and other grape diseases, consult the Kentucky Commercial Small Fruit and Grape Spray Guide 2002, (ID-94), available at Kentucky County Extension Offices.

Mites Might be A Problem in Your Orchard

Ric Bessin, UK Entomology Department

High temperatures early this summer have favored the rapid development of European red mite in commercial apple orchards. With those growers that I spoke to the mite problems were worse in some apple varieties than others. Red Delicious was the most commonly infested variety.

There are different strategies for the management of mites in apple orchards, but there is one tactic that is common to each strategy. Regardless of the type of mites that are controlled, growers must take care to avoid harming natural enemies that help to slow the buildup of mites. When conserved, these mite predators keep mites from building to damaging levels. When controlling other insects and diseases, pesticides must be selected that have the least damage to predator mites. In particular, some pyrethroid insecticides used early in the season have been shown to flare mite problems.

To control mite problems in mid-season, growers have several alternatives. One alternative is to use a summer oil to smother mites. There are several summer oils to choose from, but combinations with some other pesticides must be avoided. In particular pesticides containing sulfur such as Captan and Sevin. The summer oil labels vary considerable, but may require as much as 60 days between the application of the oil and some other pesticides in order to avoid burn to leaves and fruit.

Check ID-92, Commercial Tree Fruit Spray Guide for other miticides. One not yet listed in the spray guide is Acramite 50WS manufactured by Uniroyal Chemical. This was approved for apple use in spring 2002.

Green June Beetle

by Ric Bessin

This year is shaping up to be quite the year for green June beetle. The adults are now active across the state on various field, vegetable and fruit crops including field corn, sweet corn, peaches, apples, blackberries, and grapes. On field corn, green June beetle is of minor importance as it is primarily a pollen feeder. However, in fruit crops green June beetle can be a very serious pest because it begins to feed directly on the fruit as the sugar content begins to increase. Once green June beetle injures the fruit, Japanese beetle and wasps begin to attack the wounded fruit.

Green June beetles numbers appear to be higher than what we have seen in the last few years. There are effective sprays listed in ID-94 (tree fruit) and ID-94 (small fruit), but sprays may need to be reapplied if populations are high. In addition, the beetles selectively attack the ripest fruit close to harvest. Sevin does a good job of controlling the beetles, but has a 7 day pre-harvest interval on many small fruit crops and a 3 day pre-harvest interval on some tree fruits. Other less effective products may need to substituted for Sevin on small fruit due to the long pre-harvest interval limitation.

Green June beetle populations are cyclical and populations were high for several years about ten years ago. So I expect that we are likely to fight these battles for a few years before the numbers decline.

Grape Root Borer: the Unseen Pest Of Grapes

by Ric Bessin

While surveying for sharpshooters and other leafhoppers on grapes this weekend, I spotted what initially looked like a large, brown paper wasp sitting on a grape leaf. But it wasn't a paper wasp at all, it was a grape root borer (GRB) female moth. These moths fly during the day and are mimics of paper wasps. Less than a minute after spotting the female, it was joined by two male moths. That same afternoon, I found two other female GRB moths. At least in this one location, GRB moths were active.

GRB is one pest of grapes that is often ignored until it becomes a serious problem affecting the vineyard. Symptoms of GRB attack include poor vine growth and fruit set, even loss of some vines. The larvae spend 22 months feeding in the roots and crown of grape vines before emerging as adult moths. Generally the moths are active from July through September and lay eggs on grape leaves or weeds. The eggs hatch and the larvae drop to the ground and burrow down to the roots.

Good weed management assists with control of GRB. Eliminating weeds around the base of vines reduces the sites for egg laying and improves spray coverage for GRB control. In small plantings, plastic mulch works as an effective barrier around the base of vines, not allowing the GRB larvae to become

established. Another alternative is control through the use of mating disruption. Commercially available pheromone dispensers are placed in the vineyard at a rate of 100 per acre. This prevents the male moths from locating the females and mating. This method works best where vineyards are located away from woodlots and other wild grapes which serve as a source of mated female GRB moths. In terms of chemical control, Lorsban is the only insecticide labelled for control of GRB. This treatment is applied directly to the ground under the grape trelis at least 35 days prior to harvest. Do not allow this spray to contact the fruit or foliage. We recommend treatments for GRB if more than 5 percent of the vines are found to have GRB pupal cases emerging from the soil.

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John Strang, Extension Horticulturist

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