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Crop Conditions: Continued heat into August has slowed crop development slightly. We are a little behind normal on grape harvest, which started this week. Blueberry harvest has ended on most farms. Fall bearing raspberries are being picked, but hot, dry conditions have slowed production. Peach harvest is complete and for many growers peach harvest went well, with some nice crops being produced around the state. Harvest of summer apples is well underway and in southern areas. Gala is now being picked. Fruit size appears to be down a little this year, but as always much of this depends on how good a job of thinning was done.

Grape Harvest Parameters: Grape harvest is a few days behind normal this year. Early varieties are being harvested in southern this week. Growers should be sampling their vineyards and analyzing fruit composition (sugar, acidity, and pH) to determine the appropriate harvest date. As harvest nears, sampling should be done at least twice weekly to track the progress of fruit ripening. Samples should be representative of the entire vineyard so avoid end plants and other atypical plants when sampling. As fruit ripen, sugar concentration increases, titratable acidity decreases, and pH increases. Flavor and color also develop as the ripening process occurs. It is important to pick grapes at their peak ripeness level because grapes do not continue to ripen after they are harvested.

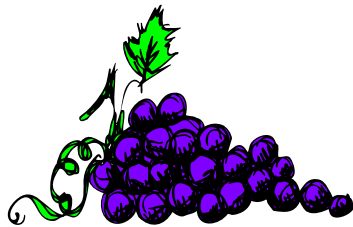
The level of ripeness desired at harvest depends on the variety and style of wine to be made. For light, fruity style wines, grapes are usually harvested before they are fully ripe. This is especially true with strong flavored American varieties, such as Concord and Niagara, and some French-American hybrids such as Cayuga White. When grapes are harvested before full ripeness

sugar may have to be added to the must before fermentation, but the results are a lighter, fruitier wine without the overpowering 'foxy' flavor. For heavier, full-bodied wines, fruit is usually allowed to fully ripen before harvest to develop full flavor, color, and tannins. If you will be selling to a winery, keep them updated on fruit composition and let them help make harvest decisions based on their needs.

Sugar (soluble solids) is the easiest parameter to measure, but is not the best indicator of optimum fruit ripeness for winegrapes. Instead, a balance of soluble solids, titratable acidity, and juice pH should be considered. Of the three parameters, juice pH is perhaps the most important. High juice pH can be a problem with certain varieties especially in warm growing seasons, and causes many problems for the winemaker. Several wine quality attributes are adversely affected by high pH including color, protein and tartrate stability, oxidative rate, metal complexing, ability to clarify, biological stability, and sensory attributes. Since pH cannot be adjusted in the winery as easily as titratable acidity or sugar content, it is

best to harvest fruit within the desired pH range. Most winemakers prefer white winegrapes with a juice pH of about 3.1-3.2 with a maximum of 3.3, and red winegrapes with a pH of 3.3-3.4 with a maximum of 3.5.

During harvest, protect fruit quality by picking early in the day while the fruit is cool, handling the fruit carefully to avoid cracked berries, juice leakage, and potential spoilage, and keeping the fruit cool by moving containers out of the vineyard quickly and placing them in shade or cold storage. Minimize the time between harvest and crush as much as possible (Bordelon)



No Plum Pox in Indiana: We have just completed sampling a number of Indiana peach orchards for the plum pox virus. I am happy to report that of the 1011 samples collected, there were no positive samples. This year we generally chose a few of the larger peach orchards across the state, from north to south. Of course, this only means that we didn't find it in the orchards we sampled, and we hope to sample more orchards next summer. Thanks to the growers who allowed us to collect leaf samples from their orchards, and if we didn't sample your orchard this year, we'll probably be calling you next year. (Hirst)

Ozone for Cider: The FDA has published the final rule permitting the use of ozone as an anti-microbial treatment for use on a range of foods, including meat, poultry and presumably, cider. My understanding is that only ozone generators manufactured by the Golden Buffalo company have been tested and approved by the FDA. In order to obtain the 5 log kill requirements, the procedure set up by Golden Buffalo must be followed. Bear in mind this is a fairly new technology and as such there are probably a few bugs still to be worked out (no pun intended). (Hirst)

Don't Put Those Sprayers Away Yet: As early apple varieties mature, it's easy for growers to get caught up in the harvest and marketing process and

start to let some other important activities slip a little. Growers need to remember that the later maturing varieties are still subject to attack by several insect pests, most notably apple maggot and codling moth. Over the last couple of years, I have had a lot of reports from growers who had significant codling moth injury in their later varieties and usually they had stopped their regular spray schedule too early. This damage may have come from the tail end of the second generation or from a partial third generation. I recommend that you continue to monitor codling moths at least until mid September so that you can detect any third generation. This is especially important for growers in the southern part of the state. I realize that life gets very hectic once you start harvesting, but don't neglect the apples that are still on the tree. As always, remember to observe pre-harvest intervals for any late season pesticide applications. (Foster)

Japanese Beetles: Once again, many fruit crops have been attacked severely by Japanese beetles. As is usually the case, some areas report that they have been worse than ever before, and others report that the damage has been light to moderate. If you are in the later category, consider yourself lucky. The good news is that the Japanese beetle season is winding down. You should notice fewer and fewer beetles re-infesting your fruit crops. Sevin remains the insecticide of choice for most situations. Again, be sure to check on pre-harvest intervals before applying a pesticide. (Foster)

Mites: Despite the hot weather we have had recently, I have not observed a flare-up of mite problems. My best guess is that the high humidity resulted in disease epidemics that kept populations in check. I have had few reports of mite problems during the last few weeks. In my plots, the populations crashed about three weeks ago. The lesson to be learned from this is that when we say mites are favored by hot, dry weather, it seems that dry may be more important than hot. (Foster)

Strawberry Fruit Bud Development: Now is the time to fertilize strawberry fields with 20 to 50 pounds of nitrogen. Applications around mid-August stimulate flower bud initiation during the fall months. Rates depend upon amount of nitrogen supplied at renovation and plant vigor. New

fields with high vigor may not need additional nitrogen now, but most older fields should benefit. Irrigation during this time is also extremely important, especially in areas of the state that have not received much rainfall. We suggest about 1 inch per week. (Bordelon)

Fall Herbicide Applications for Strawberries: A number of herbicides can be used on strawberries during late summer and fall to prevent weed germination, kill emerged weeds, and provide residue control until the following spring. The key set of weeds you need to control during this period are fall germinating winter annuals such as chickweed and shepherds purse. You may also need to control wheat, oats, or rye that come from seed in the straw mulch that you apply for winter protection.

Devrinol (napropamide) is a preemergence herbicide. It can inhibit rooting of daughter plants. Thus Devrinol should be applied after early forming daughter plants have rooted. Late forming (after late August) daughter plants do not contribute to yield and Devrinol can be applied before these plants root. Devrinol must be applied before winter annuals and small grains emerge. Devrinol provides excellent control of small grains and some winter annuals such as chickweed. Devrinol must be moved into the soil by cultivation or water after application.

Sinbar (terbacil) is primarily a preemergent herbicide but it has some postemergence activity against small susceptible weeds. Fall applications of Sinbar should only be applied after the strawberries are completely dominant. If Sinbar is applied to actively growing strawberries, injury can occur. Cultivars differ in tolerance to Sinbar. In general, less vigorous cultivars have greater injury. Applications are most effective when applied to the soil and activated by rainfall or irrigation. Sinbar provides excellent control of many winter annual weeds. Fall applications of both Devrinol and Sinbar will persist to the following spring.

Poast (sethoxydim) is a postemergent, grass active herbicide. The grasses must be actively growing. Thus Poast should be applied in late summer or early fall before plants become dormant. Also make sure that you scout your fields to determine which grass weeds are present. Summer annual grasses, such as foxtails and crabgrass, will be killed by fall frosts, and do not

require Poast applications for control. Poast is more effective against annual than perennial grasses. Poast can be used in the fall to suppress perennial grasses such as quackgrass; control early emerging small grains, and kill winter annual grasses such as wild oats and downy brome. Poast must be applied with a crop oil.

A systemic, postemergence broadleaf herbicide, 2,4-D, can be applied when strawberries are dormant to control some winter annuals. 2,4-D provides good control of many mustards and shepherdspurse, but is not very effective against chickweed. The herbicide should be applied to actively growing weeds. Be careful of 2,4-D drift causing injury to non-target plants.

Gramoxone Extra (paraquat) can be applied as a directed spray between strawberry rows, using shields to prevent contact with strawberry plants. Gramoxone is a nonselective herbicide, so it will kill or severely injure strawberries it contacts. Gramoxone is a restricted use pesticide and is extremely toxic to animals including humans. It provides excellent control of annual grass and broadleaf weeds. Gramoxone does not extensively translocate in plants so it does not control perennial weeds. Weeds should be actively growing when Gramoxone is applied.

In conclusion there are a number of herbicide options that can be used on strawberries during the fall. Select herbicides that will control problem winter annuals and small grains. Herbicides such as Devrinol and Sinbar can provide residue weed control until spring. (From Illinois Fruit and Vegetable News by John Masiunas)



Perennial Weed Control: Late summer and fall is an excellent time to control troublesome perennial weeds by spot spraying with suitable herbicides. Perennial weeds tend to become established within the rows in fruit plantings because they are not fully controlled by the normal weed management

program. Once established, these plants can be difficult to eliminate. Glyphosate (e.g. Roundup) is a particularly good herbicide for controlling perennial weeds in the fall. As perennial plants begin to slow growth and harden off for winter, carbohydrates are translocated to the roots for storage. Fall applied systemic herbicides will be similarly transported to the root system which leads to excellent control. Fall application works equally well on hard to control herbaceous perennial weeds such as thistle, dock, smartweed, and morning glory, as well as woody perennials such as poison ivy, Virginia creeper, multiflora rose, mulberry, blackberry and so on. The plants do not have to be actively growing for good results but should have sufficient active leaf area to take up the herbicide. Check the manufacturer's product label for specific recommendations. NOTE: Desirable crop plants are also translocating carbohydrates to the roots and can be severely injured by fall applied systemic herbicides. Be EXTREMELY CAREFUL when spot treating to avoid any contact with desirable plants. (Bordelon)

Soil Management and Cover Crops: Fall is a good time for cultivating fields, adding lime and fertilizer, and planting cover crops in fruit plantings. Cover crops can be an integral part of the orchard floor management plan. If you plan on establishing new orchards or vineyards next year, you should consider a pre-plant soil management program which includes deep subsoiling, soil pH adjustment, addition of fertilizer (especially P and K) according to soil test recommendations, and planting cover crops. Cover cropping a site the year before planting is an excellent way to increase organic matter and reduce weed problems. Several cover crops are available for fall planting, and mid to late September is the best time to plant in most areas of the state. A favorite among growers is winter rye because it performs very well under Indiana conditions. Rye not only adds large amounts of organic matter to the soil, but also suppresses the development of many annual and perennial weeds. There are several other cover crops and the choice depends on the grower's specific preferences and needs. (Bordelon)

Hot Off the Press: Dr. Celeste Welty of Ohio State University is pleased to announce the publication of her long awaited bulletin titled Orchard

Spray Rates: How to Determine the Amount of Pesticide and Water to Use in Your Orchard. You may purchase Bulletin #892 for \$1.25 at Extension offices or pull it up on the Internet at: <http://www.ag.ohiostate.edu/~ohioline/b892/index.html>.

Included below is a sample from the bulletin dealing with dilute and concentrate spray definitions:

Background: Dilute Applications

In the Midwest tree fruit spray guide, we still list the pesticide rate per 100 gallons of water. This is the rate that should be used if the grower needs to make a dilute application with either an airblast sprayer or a handgun sprayer. When a tank of pesticide is mixed at the dilute rate, the applicator should apply it to the trees until all parts of the tree are wet. This is what we call spraying to the point of runoff, that is, until water begins to drip off the leaves. It normally takes about 400 gallons per acre to make a dilute application on full sized apple trees.

In many large commercial orchards, the only time that a dilute application is used is for sprays of superior oil in the delayed dormant period in the spring, when the entire surface of the apple tree needs to be covered for good control of European red mite. In some smaller orchards, dilute applications are sometimes used throughout the growing season. Larger orchards usually are not treated with many dilute applications because they are more time consuming.

Background: Low-Volume or Concentrate Applications

Modern airblast sprayers, which are also known as speed sprayers, can cover fruit trees with much less than 400 gallons of spray mix per acre. Airblast sprayers produce fine droplets that cover foliage very well without the large amount of water needed to reach the point of runoff. Low volume applications made with airblast sprayers are most commonly in the range of 40 to 80 gallons per acre.

Low-volume applications are also called concentrate applications because as the volume of water is decreased, there is a proportional increase in the concentration of pesticide in order to apply the needed amount of pesticide per acre. Low volume orchard sprays are commonly concentrated to several times the dilute rate. If the fruit grower uses what is called a 3X concentration, the volume

of water is reduced to one third of the dilute volume and therefore the pesticide is increased by three times the dilute rate. Note: The pesticide is increased by three times the dilute rate, not three times the concentrate rate! When a 5X concentration is used, the volume is reduced to one fifth of the dilute volume and therefore the pesticide concentration is increased by five times the dilute rate. Orchard sprays in the range of 2X to 5X are common. (From Ohio Fruit ICM News Vol. 5 No. 30)

Indiana Pesticide Clean Sweep: On Thursday September 6, 2001, licensed pest control operators, golf courses, ag facilities, and farmers will be given the opportunity to dispose of unwanted, suspended, or cancelled pesticides through a program sponsored by the Office of the Indiana State Chemist (OISC) through a grant provided by EPA.

The Indiana Pesticide Clean Sweep project will accept any currently registered, cancelled and/or suspended, opened, unopened, usable, unusable herbicides, insecticides, rodenticides, fungicides or miticides. You should only bring containers that are labeled, leak-free, and safe to transport. Materials should be left in their original containers - DO NOT mix materials. In case of an emergency, we ask that you bring a list of products you are carrying and phone number of a responsible party to be contacted. Pesticides brought in leaking and unlabeled containers will not be accepted.

The site of the pick up will be West Apple Orchard located at 9470 County Road 500 West in Brazil, Indiana. Directions to West Apple Orchard: North off of State Road 340 on County Road 500 West. Orchard is located 1.5 miles north of State Road 340 on the west side of the road. We will accept deliveries between 9:00 am and 3:00 pm. To assist in planning, we are requesting information on the type and volume of materials you will be delivering. We must have your form returned by August 30 to the Office of the Indiana State Chemist attention Kevin W. Neal. Forms are available through the OISC.

This service is provided free of charge for up to 200 pounds. Over 200 pound will be a \$2.00 per pound charge up to 250 pounds. If you were to dispose of 250 pounds of pesticides on your own,

the charge would be approximately \$2,500. The most you will pay under the "Clean Sweep" program is \$100.

This is a great opportunity to dispose of unwanted products at little or no cost. Contact Kevin Neal at 765-494-1585 if you have any questions, or to get a copy of the form.

Indiana Horticultural Congress: Planning is currently underway for next year's Hort Congress which will be held January 28-30, 2002 at the Adams Mark Hotel in Indianapolis. We will be developing topics over the next few weeks and could use your input. If you have a burning issue you would like us to address, please let us know soon. Remember, the congress is for the participants, not the organizers, so let us know what you want.

Upcoming Meetings:

January 28-30, 2002 – Indiana Horticultural Congress. Adam's Mark Hotel, Indianapolis. Watch for more details in the future. Visit www.hort.purdue.edu

Department of Horticulture &
Landscape Architecture
Purdue University
1165 Horticulture Bldg.
West Lafayette, IN 47907-1165

Bruce Bordelon
1165 Dept. of Horticulture &
Landscape Architecture
Purdue University
West Lafayette, IN 47907-1165
765/494-1301
e-mail: bordelon@hort.purdue.edu

Paul Pecknold
1155 Dept. of Botany & Plant Path.
Purdue University
West Lafayette, IN 47907-1155
765/494-4628
e-mail: Pecknold@btny.purdue.edu

Peter Hirst
1165 Dept. of Horticulture &
Landscape Architecture
Purdue University
West Lafayette, IN 47907-1165
765/494-1323
e-mail: hirst@hort.purdue.edu

Rick Foster
1158 Dept. of Entomology
Purdue University
West Lafayette, IN 47907-1158
765/494-9572
e-mail: Rick_Foster@entm.purdue.edu

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