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Kentucky Fruit Facts

October 2006 (10/2006)

Fruit Facts can be found on the web at: http://www.ca.uky.edu/fruitfacts/

John Strang, Extension Fruit Specialist, Editor
Karen Shahan, Administrative Assistant

Fruit Crop News

Frost has glazed the pumpkins and most Kentucky growers have just about all of their apples in the barn. Fruit size and color have been excellent this year. Apple flavor has not been as good due to excess rainfall. This has been more noticeable on trees that were not thinned quite as well as desired. Tom Priddy in the U.K. Agricultural Weather Center reports that we experienced the second wettest and eighth coolest September on record.

The bottom line is that apple sales have been exceptional for most growers.

Upcoming Meetings

Nov. 9-10 2006 Tomato Disease Workshop, North Carolina State University, Mountain Horticultural Crops Research and Extension Center, 455 Research Drive, Fletcher, NC. 28732. This meeting is coordinated by Dr. Kelly Ivors and Dr. Randy Gardner. Registration ($50) should be completed and sent in on or before October 23, 2006 and includes lunch . Contact Kelly Ivors, e-mail: kelly_ivors@ncsu.edu or Jeanine Davis phone: 828-684-3562 for registration information.

Nov. 9-11 Southeast Strawberry Expo, Sea Trail Conference Center, Sunset Beach, NC (between Wilmington, NC and Myrtle Beach, SC) Includes a farm tour, two intensive workshops (high tunnel production and strawberry plasticulture for new growers), an extensive trade show, and a day and a half of educational sessions. The Expo is the leading strawberry conference in the Southeast and attracts growers from as far away as Canada and Texas. For more information call Debby Wechsler 919-542-3687, email ncstrawberry@ mindspring.com, or visit www.ncstrawberry.com

Nov. 30 Illinois/Iowa Fruit and Vegetable Conference. Scott Co Extension Office, Bettendorf, IA. Contact: Maurice Ogutu, PH: 630-325-1274, for more information.

Dec. 5-7 Great Lakes Fruit, Vegetable and Farm Market Expo. Grand Rapids MI. Refer to Expo Web site at http://glexpo.com/index.php

Dec. 6-7 Organic Production and Consumer Driven Marketing for the Farmer Entrepreneur. Interstate Ctr, Bloomington IL. Refer to meeting web site at http://asap.aces.uiuc.edu/orgconf/

Dec. 10-12 Tennessee Fruit and Vegetable Growers' Conference, Marriott Hotel, Nashville, TN. This years program is excellent and will feature a number of out of state speakers. Contact Dave Lockwood Phone: 865-974-7421, e-mail: dlockwood@utk.edu

Jan 4 Illiana (Illinois/Indiana) Commercial Vegetable Grower School. Teibel's

Inside This Issue:

Restaurant, Schererville IN Contact Maurice Ogutu, PH: 630-325-1274, for more information.

Jan. 8-9 Kentucky Fruit and Vegetable Conference and Trade Show, Holiday Inn North, Lexington, KY. Contact John Strang 859-257-5685; e-mail jstrang@uky.edu

Jan. 11-13 Illinois Specialty Crops and Agritourism Conference. Crowne Plaza Hotel, Springfield IL. For more information, including details on the Food Service Sanitation Manager Certification (FSSMC) Refresher Course, refer to the Illinois Specialty Growers web site at http://specialty-growers.org/confagenda.htm.

APPLES ARE SUSCEPTIBLE TO POST-HARVEST DECAYS

by John Hartman, U.K. Extension Plant Pathologist

Kentucky apple growers often store fruits for some weeks or months after harvest in order to extend the apple sales season. Growers know to be careful to avoid placing bruised or injured fruits into storage. Growers are also aware that even with good storing varieties, the longer apples are stored, the more likely decay is to occur. Fungicides applied to the trees before harvest also help to extend storage life. For fruits already in storage, growers will want to carefully monitor the condition of the apples.

In storage, one of the main pathogens encountered is the fungus *Alternaria*, which commonly invades the apple core of cultivars having open calyces such as Delicious and Fuji. The main symptom is mold growth in the seed cavity or core. Other fungi can also infect these open calyxes. On rare occasions, Alternaria can also cause a superficial rot, in addition to moldy core. Symptoms of *Alternaria* rot include round, dark brown to black, shallow lesions around skin breaks. In the beginning, these lesions are dry and firm, but become spongy.

Blue mold, caused by various species of *Penicillium*, is also referred to as soft rot or wet rot. Characteristics of this decay include a color change to light tan that eventually results in completely mushy tissue. This tissue becomes covered in blue-green spores that serve as an infection source for other fruit. In addition to wounds, lenticels can become infected in over-mature fruit. Infection by the fungus *Penicillium expansum* can result in the production of patulin, a known carcinogen. Fuji, Akane, and Jonagold have been reported to be more susceptible to infection whereas Royal Gala was reported to be more resistant.

A mold of a different color is gray mold, caused by members of the genus *Botrytis*. Infection usually occurs through bruises and breaks in the skin, but can invade through the cut stem on rare occasion. As the fungus infects, the fruit turns spongy, and eventually has the odor of cider. Prolific gray spores develop on the surface of infected fruit, and serve to spread it to adjacent apples, creating pockets of rot during storage. This fungal decay can be confused with another fungal decay called Mucor rot. Botrytis produces flat black fungal flakes called sclerotia that can persist in storage bins for years.

To reduce or minimize post-harvest rots:

- Harvest fruit at maturity, avoiding over-mature fruit.
- Minimize fruit bruising and wounding; monitor packing and storing procedures.
- Move harvested fruit into cold storage quickly.
- Disinfest contaminated bins and storage walls before reuse using steam, or a solution of 10% bleach and 1% detergent, or commercial disinfectant (like Zerotol). The addition of detergent is necessary for the bleach to actually kill these thick walled overwintering fungal structures.
- Fungicides such as Fludioxonil (Scholar) and pyrimethanil (Penbotec) are both labeled for apple post-harvest rots, and can be used as dips, drenches, or line.
- Biological control agent BioSave 110 (Pseudomonas syringae) used with either of the above fungicide helps control blue mold from infection of wounds.
- Post-harvest calcium treatments can aid in helping the fruit become more resistant to decay.
- Ultimately, like every other complicated problem, the solution to post-harvest decay involves an integrated approach, that combines proper harvest times, careful handling of fruit, and strict sanitation in the orchard, storage and packing house to minimize these post-harvest problems.

(Adapted from an article written by Dr. J. Beckerman for the Purdue University “Facts for Fancy Fruits” newsletter, October, 2006.)

Growing Pawpaw Organically in Kentucky

Kirk W. Pomper, Ph.D., Principal Investigator of Horticulture-Kentucky State University,Curator-USDA National Clonal Germplasm Repository for Asimina species,Adjunct Assistant Professor, Department of Horticulture-University of Kentucky <Kirk.pomper@kysu.edu>

The North American pawpaw has gained much attention in recent years as a potential high-value tree-fruit crop in Kentucky. The ripe fruit has a strong appealing aroma and a flavor that is similar to a blend of mango, pineapple, and banana. Pawpaws are hardy to USDA growing zone 5 and when planted in full sun in an orchard setting, trees can produce large quantities of fruit. There are a number of pawpaw cultivars in the Kentucky State University (KSU) trial in Frankfort, Kentucky and in the joint University of Kentucky and KSU trial in Princeton, Kentucky, that bear well and have large, high-quality fruit, these include: 'Sunflower', 'Overleese', 'NC-1', 'Susquehanna', and 'Shenandoah'. Some other pawpaw cultivars that have slightly smaller sized fruit but can still be recommended are: 'Taytoo', 'Taylor', 'Mitchell', 'Zimmerman', and 'Prolific'. Although pawpaw has great potential for commercial production, orchard plantings remain limited. Pawpaw fruit and products are mainly sold at farmer's markets, directly to restaurants, and via entrepreneurs on the Internet. Local delicacies made from the fruit include pawpaw ice cream, compote, jam, and wine. Many people are interested in growing and marketing pawpaws organically. The purpose of this article is to discuss what growing pawpaw organically entails and discuss some of the organic growing practices that we use at KSU. I will focus on what is most important to small growers and home gardeners who want to produce pawpaws organically.

What is Organic?

In 2002, the U.S. Department of Agriculture put in place a set of national standards that food labeled "organic" must meet, whether it is grown in the United States or imported from other countries. Organic food is produced by farmers who emphasize the use of renewable resources and the conservation of soil and water to enhance environmental quality for future generations. The standards were developed to support a philosophy of creating agricultural ecosystems that mimic natural ones. Organic crops are produced without using most synthetic products, including chemical fertilizers, synthetic pesticides, bioengineering; or ionizing radiation; the standards also exclude fertilizers made with sewage sludge. Many people who believe that they are growing their fruits and vegetables organically because they are using reduced chemical inputs and sustainable agricultural practices do not meet the Federal requirements for food sold as organic.

The organic standards.

The National Organic Program (NOP) Standards are confusing, but if you want to grow a crop and sell it as "organic" you must follow the NOP standards. The NOP website (http://www.ams.usda.gov/NOP/indexIE.htm) has detailed information on the standards. I will summarize a few of the standards in this article, but you need to read and understand them yourself (see http://www.ams.usda.gov/NOP/NOP/standards/FullRegTextOnly.html) to sell organic produce.

· Before a product can be labeled "organic," a government-approved certifier inspects the farm where the food is grown to make sure the farmer is following all the rules necessary to meet USDA organic standards. Organic producers should verify with the appropriate certification bodies that their practices and any materials they intend to use are compliant with applicable standards for their intended markets. In Kentucky, the Kentucky Department of Agriculture has established an organic certification program (http://www.kyagr.com/mkt_promo/wood/programs/organic/index.htm or call Jake Schmitz at 502-564-4983). To have a growing area certified as organic, detailed records must be kept for at least three years prior to certification, and after certification, on all organic and conventional growing practices. No synthetic fertilizers, herbicides, or other restricted items can be applied at least 3 years before certification. A farm management plan covering all aspects of agricultural production or handling must be agreed to by the producer or handler and the certifying agent. Crop rotation is required. A buffer zone must exist between organically and conventionally grown crops and must be sufficient in size or other features (e.g., windbreaks or a diversion ditch) to prevent the possibility of unintended contact by prohibited substances applied to adjacent land areas with an area that is part of a certified operation. The certifying agent determines if conventional water runoff, pesticide drift, etc., are far enough away from the organic area to prevent contamination.

The standards contain a list of certain synthetic substances allowed for use in organic crop production (205.601 in the standards) and nonsynthetic substances prohibited for use in organic crop production (205.602; e.g., ash from manure burning, arsenic, calcium chloride, tobacco dust, and others). The Organic Materials Review Institute (OMRI) provides certifiers, growers, manufacturers and suppliers an independent review of products intended for use in certified organic production, handling, and processing (http://www.omri.org) based on the NOP standards. The OMRI Products List (OPL) represents OMRI's recommendations regarding the acceptability of brand name products for organic production, processing, and handling.

During production all equipment and tools must be cleaned when they are moved from a conventional field to an organic area. After harvest physical contact, or commingling, between unpackaged organically produced and conventionally produced products must be prevented. If an operation knowingly sells or labels a product as organic that is not, it can be subject to a civil penalty of up to $10,000 per violation.

The standards and the pawpaw grower.

So how does this all relate to the small pawpaw grower who wants to sell organically grown pawpaws? There is an exception clause that states that: "A production or handling operation that sells agricultural products as "organic" but whose gross agricultural income from organic sales totals $5,000 or less annually is exempt from certification" […], "but must comply with the applicable organic production and handling requirements." Products from such operations cannot be used as ingredients in processed organic products produced by another handling operation. So growers who have small pawpaw operations whose gross agricultural income from organic sales totals $5,000 or less annually can sell organically grown pawpaws at farmer's markets, to restaurants, and via the Internet without going through the certification process, but must still comply with the organic production and handling requirements. Wild pawpaws labeled and sold as organic must be harvested from an area that has had no prohibited substance in the standards applied to for a period of 3 years preceding harvest. The wild pawpaw fruit must be harvested in a manner that ensures that such harvesting or gathering will not be destructive to the environment and will sustain continued growth and production.

Organic pawpaw culture.

Pawpaw is a unique native tree fruit that is resistant to many diseases and insect pests making this crop attractive to organic growers. However, little information concerning organic production of pawpaw is available. With a Sustainable Agriculture Research and Education Program (SARE) Research and Education Grant entitled: "Development of Organic Production Practices for Pawpaw on Selected Rootstocks" funded in 2003 to KSU, we have gained some additional information for organic growers. In this section I will cover a few of the important cultural items to consider when growing pawpaw organically. I will not concentrate on pawpaw cultivar recommendations, flowering, and ripening considerations in this document; these and other pawpaw topics can be found in the publication links listed at the end of this article.

Establishing an orchard.

Organic pawpaw production begins with selection of an appropriate site for an orchard. An orchard site that would be suitable for pawpaw or other tree fruits includes good air drainage for frost protection, a deep, fertile, well-drained soil, with a pH 5.5-7.0, and a water source for irrigation. Site preparation is extremely important for any organic operation. The presence of certain weed species is of particular concern to the organic grower. Bermuda grass, Johnson grass, quack grass, Canadian thistle, and several other pernicious species can be serious problems to growers and are difficult to control with organic methods once an orchard is established. It is important that organic orchard sites are chosen that do not have these weed species at the start. If these weed species are at your orchard site and you do not want to resort to conventional approaches prior to beginning a three year transition period, there are several options. One organic option is soil solarization. Soil solarization involves placing transparent plastic films on moist soil to capture solar energy. Solarization takes four to eight weeks to heat the soil to a temperature and depth that will kill harmful fungi, bacteria, nematodes, weeds, and certain insects in the soil. Solarization can be effective in areas such as Kentucky with many sunny days and high temperatures, but it is not effective where lower temperatures, clouds, or fog limit soil heating. Another option to eliminate weeds in fields before they are used in organic production is the use of repeated cultivation and cover crops. More information on this approach can be found at the Appropriate Technology Transfer for Rural Areas (ATTRA) web site at http://www.attra.org.

Planting stock.

To my knowledge there are no nurseries that sell organically grown pawpaw trees. According to the NOP standards, nonorganically produced planting stock is considered organic after it has been maintained under a system of organic management for a year. It usually takes about 4 years for grafted pawpaw trees to produce fruit. We presently recommend that trees be planted at a spacing of 8 feet within rows and 12 to 18 feet between rows. For the first two years, top growth is slow as the root system establishes itself, but thereafter it accelerates substantially given proper fertility and soil moisture. Shading of pawpaw in the field the first year is recommended and can be accomplished by installing translucent double-walled polyethylene "tree-tubes" around each tree, securing them with bamboo stakes. However, trees taller than 45 cm at planting do not require shading. During warm summer temperatures (>35°C), the tubes should be removed from the trees, otherwise foliage within tubes can became heat-stressed and desiccated.

Weed control and crop rotation.

The NOP standards require that a grower implement a crop rotation in the orchard including but not limited to sod, cover crops, green manure crops, and catch crops that provide the following functions that are applicable to the operation: maintain or improve soil organic matter content; provide for pest management in annual and perennial crops; manage deficient or excess plant nutrients; and provide erosion control. With fruit trees, alley cropping, intercropping, and hedgerows are used to introduce biological diversity in lieu of crop rotation. Often permanent sod is used in the alleyways for the life of the tree and areas surrounding the orchard are rotated in a manner that increases biological diversity in the orchard. However, crop rotation can be utilized in the alleyways with legume cover crops to increase the nitrogen available to trees. Green manure cover crops can be grown specifically to be cultivated back into the soil to build up soil organic matter and nutrients and help control weeds. Unfortunately, there is not any scientifically derived information concerning the best cover crops (e.g. vetch, faba beans or lupins, etc.) to grow with pawpaw. Cover crop recommendations may also vary by location in the U.S. There is additional information available at http://www.sarep.ucdavis.edu/ccrop/CCPubs/SelectingCoverCrop.html that may help guide growers in cover crops to try with pawpaw.

There are a number of organic weed control approaches within rows around trees that are options for a pawpaw planting. Controlling weeds is extremely important during tree establishment and in optimizing fruit production from mature trees. In organic farming, it is important to try to take a holistic cultural approach. The goal is not just to control weeds, but to improve the soil organic content. Cultivation around trees from the drip line to the trunk can be used to control weeds; however, cultivation must be shallow to avoid damaging roots. At KSU, we have tried mulching around trees with wood chip mulch (15 cm depth), straw, or hay. All these methods can be an effective method of weed control for at least one year and possibly two. Make sure that the straw or hay does not contain many weed seeds. For larger plantings we have used round bales of hay for mulching. The round bales are unrolled next to the row of trees and the hay moved around trees in a row. This method has been very effective in weed control and the hay degrades to add organic matter to the soil. Vole damage can be a problem with other fruit trees when using straw mulch around the trunk; however, voles do not damage pawpaw trunks. This is possibly due to the presence of acetogenin compounds in the bark. We have used flame cultivation for weed control with pawpaw with some success. Flame cultivators, such as the Red Dragon Home & Garden Flamer, are commercially available; usually they consist of a torch like attachment connected to a LP gas tank. The idea behind flame cultivation is to pass the flame over the weeds just long enough to rupture the cells of the plant and kill the weeds. At KSU we have used this approach with pawpaw trees with some success; however, be careful not to linger too long over weeds with the flame and start the weeds on fire! Additionally, do not direct the flame at the tree trunk or the bark can be damaged. Obviously, flame cultivation is not a good idea next to straw or hay mulch or during periods of low rainfall because of the fire danger.

Nutrient management and irrigation.

Excellent growth (16 to 24 inches of shoot extension per year) has been achieved with organic feather, meat, and bone and blood meal (such as 10-2-8 from Naturesafe) fertilizer broadcast under pawpaw trees in early spring at 1 to 2 oz./tree applied before budbreak each year. However, optimal fertilization requirements have not been determined yet during establishment or for bearing pawpaw trees. Compost is difficult to incorporate if woodchip or straw mulch is used around trees for weed control. Compost containing animal manure must meet specific temperature standards during production (see the NOP standards). Use of legume cover crops in

alleyways can help provide additional nitrogen to trees. Growers should conduct a foliar analysis in July to monitor your fertilization program. Irrigation during establishment improves tree survival rates and in mature trees it will improve fruit size. Irrigation requirements will vary by soil type and soil depth. A soil depth of at least 3 feet will help provide a water reservoir for the tree.

Pest and disease control.

The organic standards must be followed for pest and disease control and OMRI's recommendations regarding the acceptability of brand name products for organic production is useful. However, there are few pests or diseases that need to be controlled in pawpaw. Pawpaw leaves can exhibit leaf spot, principally a complex of *Mycocentrospora aiminae*, *Rhopaloconidium asiminae*, and *Phyllosticta asiminae*. At KSU we have also noted the presence of fungal spot (*Phyllosticta species*) on the surface of fruit in wet years; this can also cause the fruit to split during development. We have not tried to control these foliar or fruit diseases with organic fungicides; however, sulfur sprays could be attempted as a control measure since greenhouse experiments at KSU have shown that pawpaw foliage is not sensitive to sulfur damage. The pawpaw peduncle borer (*Talponia plummeriana* Busck) is a small moth larva, about 5 mm long, that burrows into the fleshy tissues of the flower causing the flower to wither and drop. We have noted damage from this borer in recent years at the KSU farm; however, with the great abundance of unaffected flowers on trees, we have not attempted any control measures. The zebra swallowtail butterfly (*Eurytides marcellus*), whose larvae feed exclusively on young pawpaw foliage, will damage leaves, but this damage has been negligible at the KSU plantings. The larvae of the leafroller (*Choristoneura parallela* Robinson) may damage flowers and leaves but damage is negligible. Japanese beetles (*Popillia japonica* Newman) can damage young leaves on pawpaw trees, but once again, the damage is usually not severe. The Asian ambrosia beetle attacked pawpaw trees in an orchard in Woodford County, Kentucky recently and killed many trees. The beetle bores into the tree trunk and limbs and carries with it a *Fusarium* fungus that clogs the vascular system of the tree. There have not been any other reports of Asian ambrosia beetle attacks on pawpaw trees and this may have been a unique situation where trees had been drought stressed the year before attack and a large wood pile near the orchard may have served as a source of large numbers of beetles.

In conclusion, pawpaw can be grown organically; however, there are many factors to consider before you start an organic operation. The standards must be followed and cultural recommendations are limited concerning the organic production of pawpaw. KSU will continue working on developing recommendations for the organic production of pawpaw.

For additional information on the organic production of fruit trees and additional pawpaw information, check out these articles on the web:

1) The Kentucky State University Pawpaw Information Website: Reports and Publications page (http://www.pawpaw.kysu.edu/reports.htm).
2) The KSU Pawpaw Planting Guide (http://www.pawpaw.kysu.edu/pawpaw/ppg.htm).
3) Southern Organic Resource Guide (http://attra.ncat.org/sorg/index.html).
4) The Kentucky Department of Agriculture Division of Value-Added Plant Production: Organic Program (http://www.kyagr.com/mkt_promo/wood/programs/organic/index.htm).
5) The University of Kentucky Extension Service: Organic Certification Process (http://www.uky.edu/Ag/NewCrops/introsheets/organiccert.pdf).
6) ATTRA Tree Fruits: Organic Production Overview (http://attra.ncat.org/attra-pub/fruitover.html).
7) Selecting the Right Cover Crop Gives Multiple Benefits (http://www.sarep.ucdavis.edu/ccrop/CCPubs/SelectingCoverCrop.html).
8) Washington State University Tree Fruit Research and Extension Center Organic & Integrated Fruit Production Home Page (http://organic.tfrec.wsu.edu/OrganicIFP/Home/Index.html).
9) Disease Management Guidelines for Organic Apple Production in Ohio (http://www.caf.wvu.edu/Kearneysville/organic-apple.html).
10) National Organic Program Standards (http://www.ams.usda.gov/NOP/NOP/standards/FullRegTextOnly.html).
11) Organic Materials Review Institute or OMRI (http://www.omri.org).

Cleaning Herbicide from Sprayers

W. E. Mitchem and D. W. Monks, North Carolina State University, Raleigh NC

It is not uncommon for growers to use one sprayer on a variety of crops for applying a variety of crop protection products. Although this is common, it can be risky when using herbicides because of the sensitivity of some crops to herbicides. Probably the best known example is broadleaf-crop (tomato, cotton, cucurbit crops, etc.) sensitivity to 2,4-D. Another potential concern is non-glyphosate-tolerant crop sensitivity to glyphosate. There is more glyphosate being used today than any other herbicide; and with that much use, the liklihood of accidental injury to non-glyphosate tolerant crops has increased. It takes only traces of some herbicides to cause a huge loss; therefore, the extra time it takes to clean herbicides from sprayers is very worthwhile.

Table 1 lists common herbicides along with their tank cleaning procedures. Although the table is fairly comprehensive, growers use some products not included in the table. For products not listed, consult the product label for sprayer clean-up directions. Crop sensitivity information is provided as a guide; however, this information is not all inclusive, and a crop may be sensitive to a certain product even though it is not listed.

Table 1. Tank Cleaning Procedures to Prevent Injury to Sensitive Crops

Herbicide	Cleaning Procedure	Other Notes
2,4-D amine, 2,4-D ester, Banvel, Weed Master, Stinger	Fill empty sprayer with clean water and rinse. Refill with 1 percent ammonia solution and circulate solution through booms. Allow solution to stand in sprayer for several hours; then flush solution through boom and tank. If ester formulation was used, rinse tank first with kerosene or fuel and then use ammonia solution. After removing ammonia solution, follow with two rinses of clean water. Nozzles should be removed and cleaned separately.	All broadleaf crops are sensitive to 2,4-D, Banvel, and Weed Master. Tomato, Pepper, Egg Plant, and leguminous crops are sensitive to Stinger.
Beacon, Permit, Sandea, Exceed and Peak	Rinse empty tank with clean water. Fill tank with a 2 percent ammonia solution. Circulate solution through sprayer for 15 minutes. Repeat previous procedure. Finally, rinse tank with clean water. Clean nozzles and screens separately.	Bean, pea, tomato, pepper, and cucurbit crops are very susceptible to Beacon, Exceed and Peak.
Accent, Ally, Assure, Basis, Basis Gold, Finesse, Staple, Firstrate	Flush entire sprayer with clean water for five minutes. Fill tank with water and 1 qt of ammonia for every 25 gal of water and then operate sprayer for 15 minutes. Repeat the procedure then remove nozzles and screens to clean them separately. Fill tank with clean water and operate sprayer for five minutes.	Leguminous vegetables, cucurbit crops, tomato and pepper. Corn is sensitive to Assure and Staple.
CanopyXL, Classic, Harmony Extra	Flush sprayer with clean water for five minutes. Fill tank with 1 percent ammonia solution or commercial tank cleaner and operate sprayer for 15 minutes. Drain the tank; remove nozzles and strainer to be cleaned separately with cleaning solution. Repeat procedure and then fill tank half full with clean water and operate sprayer for five minutes.	Tomato, pepper, corn, cucurbit crops are susceptible to Canopy XL and Classic.
Poast, Poast Plus	Rinse tank and fill with clean water. Operate sprayer for five minutes. Fill tank with 1 percent ammonia solution or 1 pt detergent in 100 gal of water or use a commercial tank cleaner. Operate sprayer for five to 10 minutes circulating solution through the boom and nozzles. Let solution stand in tank and lines for 24 hours then flush tank, boom, pump and hoses twice with clean water.	All grass crops are sensitive.
Fusilade, Select	Rinse tank with clean water. Operate sprayer for five minutes circulating clean water through the pump, boom and nozzles. Fill tank with 1 percent ammonia solution or a commercial tank cleaner then operate sprayer for 15 minutes. Drain tank and remove nozzles and screens for cleaning separately. Repeat cleaning procedure with cleaning solution. Allow solution to stand in tank for several hours. Empty tank and rinse with clean water while operating sprayer, allowing water to move through pump, hoses and nozzles.	All grass crops are sensitive to Fusilade and Select.
Pursuit, Scepter, Cadre	Fill tank with clean water and operate sprayer for 15 minutes. Thoroughly rinse tank. Repeat procedure a second time.	Tomato, pepper, corn, cucurbit crops, and some beans are susceptible to injury
Glyphosate	Fill tank with clean water and operate spray for 15 minutes. Thoroughly rinse tank. Repeat this procedure.	All non-glyphosate tolerant crops are susceptible.
Atrazine or any premix containing atrazine	Rinse tank with clean water and operate sprayer for five minutes. Fill tank with a 1 percent ammonia solution or a commercial tank cleaner and operate sprayer for 15 minutes. Drain tank. Clean nozzles, strainers and line filters with ammonia solution. Repeat procedure. Fill tank with ammonia solution and leave in tank for several hours. Empty tank and rinse with clean water while operating the sprayer to rinse lines.	Beans, peas, tomato, pepper, cabbage, strawberry, cucurbit crops are sensitive to atrazine.
Command	Rinse inside walls of tank with quantity of water equal to 1/8 of the total tank volume and operate sprayer for 15 minutes. Drain tank and remove nozzles, screens and line filter for washing in warm, soapy water. Repeat procedure.	Small grain, corn, tomato, pepper.

Receiving Fruit Facts Electronically on the Internet

Fruit Facts is available on the web in the pdf format. To get notification of the monthly Fruit Facts posting automatically and approximately two weeks earlier than it would normally be received via mail, you can subscribe to the UK College of Agricultures's Majordomo list processor.

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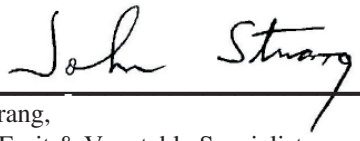

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