New York Berry News

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What's Inside

Late January through mid-February is the slowest time of the year for most berry growers. But as we approach March (and the beginning of Spring!), raspberry and blueberry growers should be thinking about pruning their blueberry and bramble plantings. Two articles by Marvin Pritts are given here to help guide your thinking and plan your approach to pruning this winter. Strawberry growers, on the other hand, should consider putting in their orders for row cover. Lori Bushway gives some of the details on using rowcover and outlines some of the benefits you should expect if you choose to use rowcover. Kathy Demchak, our friend to the south, reports on her findings on the performance of many new varieties in her variety trial. Also in this issue of the NY Berry News, we provide you with an update on recent pesticide registrations, cancellations, and label changes that berry growers should be familiar with.

Upcoming Meetings

February 18-19, 2004: *Ontario Fruit and Vegetable Convention and Trade Show*, Brock University, St. Catherines, Ontario. (905) 563-6901.

February 22-25, 2004: Mid-Atlantic Direct Marketing Conference and Trade Show, Clarion Hotel and Conference Center, Cherry Hill, N.J. (609) 625-0056, www.madmc.com

February 23-25, 2004: *North American Strawberry Growers Association Annual Meeting*, Hilton Westshore, Tampa Bay, FL. For more information Contact Patricia E. Heuser at 814-238-3364. Email: info@nasga.org.

February 24-25, 2004: *Hudson Valley Commercial Fruit Grower School*, Holiday Inn, Kingston, NY. For more information contact Barbara at 845-340-3990.

February 26, 2004: Upper Hudson/Champlain Commercial Tree-Fruit School, Lakeview Hotel and Conference Center, Lake George, N.Y. Nancy Kiuber, (518) 885-8995, nak5@cornell.edu or Kevin Iungerman, kai3@cornell.edu.

February 26-28, 2004: *19th Annual NY Farm Show*, Syracuse, NY. Over 400 companies and manufacturers were represented in 2003! For more information contact Scott Grigor, Show Manager at 315-457-8205, Email: sgrigor@ne_equip.com.

March 11-12, 2004: *2004 Produce Marketing Conference*, Hilton Inn, Grand Rapids, MI. For more information contact Wen-fei Uva at 607-255-3688 or by email at wl32@cornell.edu.

News from California

Craig Chandler, Department of Breeding and Genetics, University of Florida, Dover, FL.

[*Editors Note*: I provided this news clipping primarily for the content in second paragraph. It is truly significant to note the redirection of the CA industry to fund nursery-based research focusing, essentially, on the production of plants free of fungal and bacterial pathogens.]

A California Strawberry Commission newsletter recently reported that, based on a commission survey, California strawberry acreage for the 2004 season stands at 31,639 acres. This is 3,409 acres or 12.1% greater than the 2003 acreage. The Oxnard area had the largest gain in acreage (+1,555), giving it a total of 10,349 acres for 2004. 'Camarosa' remains the top cultivar in California, with 9,832 acres planted (31 % of the state's acreage), while proprietary cultivars (from Driscolls, Cal Giant, Plant Sciences, Inc., etc.) occupy a total of 9,757 acres. Acreage in 'Ventana' has more than doubled from last season to this season, with this new cultivar now occupying 2,777 acres (or 9% of the state's acreage).

Representatives from the Commission, the University of California, the USDA, and the California strawberry nursery industry met in early December to discuss

priorities for nursery-based research. Areas identified as high priority by the participants include the following: 1) determine how pathogens are introduced and spread in the nursery; 2) develop methods to detect pathogens in the nursery and in transplants before they are set in the fruiting field; and 3) develop control methods to prevent the introduction and spread of pathogens in the nursery. Meeting participants agreed that the Commission and nurseries should share the cost of conducting nursery-based research and a future meeting will be held to work out funding details.

Increase Strawberry Productivity with Early Spring Rowcover

Lori Bushway, Senior Extension Associate in Berry Crops, Cornell University. Ithaca, NY

Many different cultural practices have been recommended to Northeastern strawberry growers over the years, but none has proven to be consistently beneficial to all growers. The exception to that may be the use of early spring rowcovers. Research at Cornell and elsewhere has repeatedly found spring rowcovers to positively impact plant development, carbohydrate reserves, and productivity in strawberry fields.

Straw mulch is applied over the strawberry planting in late fall to protect plants from winter injury. However, plants left under winter straw mulch into April show greater than 50% decline starch content, a loss of root biomass and subsequently lower yields. Creating a more favorable plant microclimate in late March and April by removing straw mulch and covering plants with synthetic rowcovers improves photosynthetic rates of leaves, enhances starch accumulation, accelerates plant development (including earlier fruiting) and increases total fruit yield. As a general rule, March is an appropriate time to remove protective winter straw mulch and apply rowcover. The rowcovers should be removed soon after flowers are observed. Without wind or bee activity, pollination will be reduced and fruit will be deformed. If cold temperatures (<30F) occur when covers are still in place and flower trusses have emerged, water can be applied directly over the rowcovers for frost protection. The economics of rowcover use is favorable if the material is reused for several springs.

Details on spring microclimate studies can be found in the following article: Lori J. Bushway and Marvin P. Pritts. 2002. Enhancing Early Spring Microclimate to Increase Carbon Resources and Productivity in June-bearing Strawberry. *Journal of the American Society for Horticultural Science* 127(3): 415-422. http://www.ashs.org/journal/

What's New in Pesticides?

Bill Turechek, Department of Plant Pathology, Cornell University, Geneva, NY

Several fungicides, insecticides and herbicides have been registered for use on berry crops in the state of New York recently. Moreover, there have been some significant cancellations and/or label changes for a few of the pesticides used commonly by NY growers. In this article I will summarize the new registrations, label changes, and cancellations that have occurred over the past two years plus give you a "heads up" of what to expect for new registrations or cancellations in the near future.

Fungicides: registrations & cancellations

Abound 2.08F was recently labeled for use on blueberry, caneberry (raspberry and blackberry), currant, gooseberry, and now strawberry. This strobilurin fungicide is labeled for a number of diseases but is particularly effective against anthracnose of strawberry, strawberry leaf spot, powdery mildew, and spur blight of raspberry. Abound has not been shown to particularly active against mummyberry on blueberry. Unfortunately, the use of Abound may be limited because Abound is extremely **phytotoxic** to certain apple varieties. Abound should never be sprayed where spray drift may reach apple trees or when conditions favor drift beyond intended area of application. Indeed, the phytotoxic effects are so extreme that spray equipment that has been previously used to spray Abound should not be used to spray apple trees.

Captan 80WDG is a new formulation of the old, workhorse fungicide captan. With its introduction came two significant label changes that fruit growers should be made aware of. First, Captan 80 WDG is now labeled on raspberry and blackberry for use against anthracnose, gray mold and spur blight. Second, although not important to berry growers *per se*, the REI on apple was reduced from 96 hr to 24 hr. The REI on strawberry remains at 24 hr; unfortunately, the REI on raspberry and blueberry is 72 hr.

CaptEvate 68WDG was granted registration late last year on strawberry and blueberry for use against gray mold and anthracnose. CaptEvate is a mixture of the fungicides fenhexamid (Elevate) and captan. Elevate is an excellent gray mold fungicide while captan has good activity against anthracnose and some activity against gray mold.

Indar 75WSP was granted a section 18 by the EPA for use on blueberry against mummyberry on February 5, 2004. The section 18 expires June 30, 2004. Under this section 18, a maximum of five applications may be made at 10-14 day intervals, at a rate of 2 oz. of Indar per acre. No more than 10 oz. of Indar per acre may be applied per year. A worker re-entry interval (REI) of 12 hours and a pre-harvest interval (PHI) of 30 days must be observed. Indar may not be applied through any type of irrigation system.

Quadris 2.08F is no longer labeled on strawberry. Quadris has the same active ingredient as Abound (i.e., azoxystrobin). Syngenta recently reshuffled the crop labeling with the azoxystrobin family of fungicides; Abound is now labeled for use on all berry crops.

Rovral (all formulations) Bayer CropScience has requested cancellation of the use of Rovral on blueberry in response to the extensive damage to the Southeastern blueberry crop last year.

Switch 62.5WG was labeled for use on strawberry in early 2003 and then later in the year on blueberry, caneberry, currants and gooseberry. The fungicide is a mixture of fludioxonil (aka Scholar) and cypodinil (aka Vangard). Switch is labeled for and is an excellent fungicide against gray mold. Some researchers have claimed that Switch is also active against strawberry anthracnose. We will be testing Switch against anthracnose this season.

Insecticides: registrations & cancellations

Confirm 2F was labeled in 2002 for use on bushberries (including blueberry, currant, and gooseberry) against cranberry and cherry fruitworm (and others) and against several leafrollers on caneberries. Note: In NY, Confirm can not be applied within 25 feet, or by air within 150 feet of lakes, reservoirs, rivers, permanent streams, marshes, or natural ponds; estuaries and commercial fish farm ponds.

Entrust is an organic formulation of Spintor (see below) labeled on bushberry and strawberry.

Guthion Solupak will be labeled on raspberry for raspberry crown borer in 2004. Unfortunatley (and oddly), this registration will expire in 2005!

Savey 50DF was recently labeled on caneberry (raspberry, blackberry, etc.) and strawberry against twospotted spider mite.

Spintor 2SC label was expanded to include blueberry in 2002. Spintor is labeled on several berry crops for a variety of pests including cranberry, cherry, and raspberry fruitworms.

Herbicides: registrations & cancellations

Sinbar was granted a supplemental label allowing for its use on first year strawberries. Sinbar may be used shortly after transplanting but before new runner plants start to root. If strawberry transplants are allowed to develop new foliage prior to Sinbar application, the application must be followed immediately by 0.5 to 1 inch of irrigation or rainfall to wash the Sinbar off the strawberry foliage.

What to Expect

Cabrio and ***Pristine*** are two new fungicides manufactured by BASF that are registered in every state except for New York. Cabrio is a strobilurin fungicide, similar to Abound but exhibiting no phytotoxicity towards apple, and Pristine is a mixture of Cabrio and Endura, an excellent gray mold fungicide. The delay in registration is the result of a bureaucratic snafu which may (or may not!) be resolved by 2005. Growers who are interested in having these products registered in a timely fashion should consult with their grower organization, like the NY Berry Growers or the NY Horticultural Society, to have them petition NYDEC for a speedy resolution.

Zeal Miticide (Valent Agricultural Products) was recently granted a federal registration for use on strawberry. Zeal is expected to receive a NY registration in 2005.

Blueberry Pruning and Rejuvenation

Marvin Pritts, Department of Horticulture, Cornell University, Ithaca, NY

Regular pruning is an essential component of blueberry management, yet its importance is often misunderstood because the costs to the neglectful grower are not immediate. Pruning is required to maintain the vigor and productivity of bushes, to aid in disease and insect management, to maintain large fruit size and quality, and to develop an appropriate growth habit for harvesting. A young blueberry plant will produce many canes for the first several years. Cane production will gradually slow as bushes become tall. Yields will decrease because of the absence of new growth on which flower buds will form. An increasing amount of leaf area will be required to satisfy the respirational demands of both the fruit and wood. Furthermore, light penetration into the canopy will diminish, resulting in a shift of fruit production to the exterior of the bush, causing a decrease in bearing surface. Appropriate pruning practices can maintain a blueberry bush in an efficient and productive state, without the detrimental changes described.

Selecting canes for removal

When selecting canes for removal, first look for any winter-injured or broken canes, or canes with disease and insect damage. If injury is severe, remove that particular cane. Cankers and scales are common pests that can be partially controlled through pruning. Second, remove any cane that is rubbing against another to prevent canker infections. Third, remove those that are interfering with movement through the alley. Aim for a plant with an upright growth habit, yet with a sufficiently open canopy to allow for light penetration. Mechanically harvested bushes should be trained to a more upright habit and narrower crown than those that are hand harvested. Finally, remove short, branched canes that never receive much light. If these canes produce fruit, it will ripen late and will rarely be harvested. Care should be taken to remove canes as close to the crown as possible. Do not leave 6 to 8 inch stubs. These will rot and act as a source of disease inoculum.

Time of pruning

Early spring is the best time to prune blueberries. Although some growers begin pruning immediately after harvest, it is thought that this makes plants more susceptible to winter injury and reduces the long-term productivity of bushes. By pruning in early spring, one can identify winter injured wood and remove it. Carbohydrates produced in autumn will also have had sufficient time to move into the roots and crown for storage.

Pruning young bushes

Little pruning is required on young bushes. Remove flower buds for the first two years to promote vegetative growth (Figure 1). This can be achieved by rubbing off the fruit buds, or by pruning the tips of shoots where the flower buds are located. At the beginning of the third year, remove any twisted or low-growing canes to promote new cane production. If more than two new canes were produced the previous year, remove all but the two healthiest at the crown level. In subsequent years, continue light pruning until the plants reach full size, removing all but 2 or 3 of last season's canes. When plants are about 8 years old, they should contain between 10 and 20 canes of many different ages. Some cultivars produce many more canes than others, so the amount of pruning that is required on young bushes will vary with cultivar.

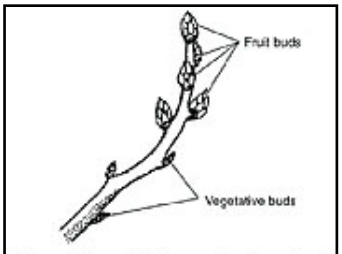

Figure 1. Types of buds on a blueberry shoot

Mature bushes

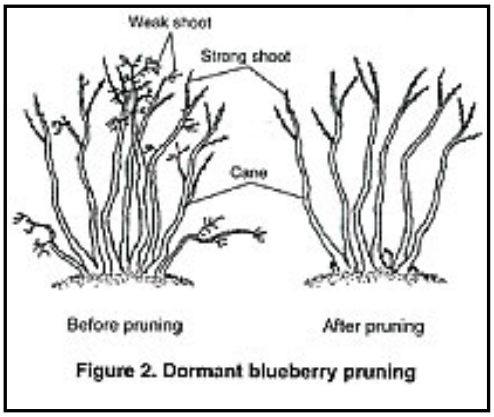

Figure 2. Dormant blueberry pruning

Eight year old canes start to lose their productivity as more leaves are required to support a given amount of fruit on those canes. In addition, canes have branched considerably, and the most recent growth on which flowers form is usually thin and weak. Removing one or two of the largest canes in a mature bush will promote new cane growth. If bushes contain a mixture of canes of different ages, then annual removal of canes that have reached 8 years of age will allow for a minimal reduction in productivity, as 7-year-old canes grow to replace those that were removed. Regular renewal will allow for consistent long-term productivity.

Canes larger than one inch in diameter are not as productive as younger canes, and eventually should be removed. If one or two of the largest canes in a mature bush are removed annually, and one or two new canes are permitted to grow, then an even age structure among canes can be maintained. In general,

up to 20% of the older wood can be removed from a bush without adverse effects on yield. Although berry numbers will be reduced, larger fruit will compensate for this decrease.

Regularity of pruning

Annual pruning is essential for stable production and high productivity. When bushes are pruned irregularly, young canes are produced in great numbers the year after heavy pruning. These canes will age together, and become unproductive at the same time. If one then wants to prune out the unproductive canes, nearly the entire bush will have to be removed. Also, no young growth is present to make up for the loss of fruiting wood. Therefore, irregular pruning results in erratic yields from year to year, and tall bushes will develop as individual canes elongate to compete for light. Research has shown that annual, moderate pruning produces bushes with the fewest canes, but with the greatest yields.

Detailed pruning

Removing injured wood should be the primary objective of detailed branch pruning in the tops of the canes. Branch pruning can result in higher fruit quality because berry numbers are reduced. Also, branch pruning can help relieve drought stress in hot climates where plantings are unirrigated. However, if one has done a good job removing whole canes, then little detailed pruning will be required. Weak bushes require more pruning than vigorous bushes because pruning stimulates vegetative growth. Also, special consideration must be given varieties with spreading habits. Sprawling canes should be removed, but care should be taken to leave sufficient canes for fruiting.

Rejuvenation

When rejuventaing an old planting, remove one or two old canes for every five or six younger canes. In following years, remove up to 20% of the wood until new cane growth occurs. Keep only 2 or 3 new canes and continue to remove up to 20% of the oldest canes. Eventually, the bush will become more productive, cane numbers will decrease, and bush stature will decline. In old, poorly maintained plantings, some growers have had success cutting all the canes to ground level; harvesting begins 3 years later. However, for this system to be most effective, canes must be thinned to the most vigorous 6 - 10. Others find that summer hedging immediately after harvest, coupled with selective dormant cane removal, works well.

Summary

Pruning is an investment in the future productivity of the blueberry planting. Regular annual pruning will spread costs throughout the life of the planting, ensure stable production from year to year, and serve as a useful tool for managing pests, fruit load, and quality. For more information on blueberry production visit Marvin Pritts' course information site at http://courseinfo.cit.cornell.edu/courses/HORT442/. Use "guest" / "guest" as your login and password!

Pruning Summer- and Fall-Bearing Raspberries

Marvin Pritts, Department of Horticulture, Cornell University, Ithaca, NY
[*Edited (i.e., shortened) by Bill Turechek*]

Plant growth can be manipulated by growers to achieve long-term increases in production of quality fruit. Pruning affects plant growth rate, fruit quantity and size, soluble solids (sugars), disease susceptibility, ease of harvest, and spraying efficiency. Brambles respond significantly to pruning, but these practices are usually the most expensive and time-consuming part of an operation. Growers must use care when choosing pruning strategies. The following discussion presents different types of pruning methods for primocane-fruiting and floricane-fruiting brambles that best promote high yields of high quality fruit.

Primocane-Fruiting (fall-bearing) Raspberries

Primocane-fruiting raspberries produce fruit at the top of first-year canes in late summer. If allowed to overwinter, these same canes will produce fruit again in early summer of the second year. However, the quality of this early summer fruit is inferior to both the late summer primocane crop and summer crops of floricane-fruiting types. Also, harvesting the early summer second-year crop is difficult because of interference from new primocanes. Likewise, harvesting the late summer primocane crop is difficult because the primocanes are thinner and taller when the second-year canes are allowed to grow, too. Most growers sacrifice the early summer second-year crop in favor of a smaller, but higher quality late summer primocane crop. The smaller yield of a single late summer primocane crop is offset by the ease of management.

To prune primocane-fruiting raspberries for a single late season crop, the canes need only be cut to the ground in early spring. New canes will grow each year and fruit in late summer, the canes will be cut early the following spring, and the cycle continues. It is important to cut old canes as close to the ground as possible so that buds will break from below the soil surface. If canes are not cut low enough, fruiting laterals may form on any remaining cane portion. These fruiting laterals are not healthy; they are entry sites for insects and disease pathogens. Also, any fruits that form will most likely rot, attracting pathogens and creating a source of inoculum (disease-conducting material) for the late summer crop. All canes that are cut from the planting should be removed from the area and destroyed. In warm climates, the primocane crop can be delayed by mowing the young primocanes a second time when they are approximately 1 foot tall. Pinching the primocanes (removing the growing tip) in July to stimulate growth of laterals will also delay fruiting. This is sometimes done to delay harvest until after the intense heat of July.

The timing of cane cutting is also important. Carbohydrates move from plant leaves into the crown in autumn, and from the crown to the buds in early spring. If canes are cut before all the carbohydrates reach the crown in autumn, the new canes may not be as vigorous the following year. Canes can also be cut too late, after carbohydrates have moved into the buds. From December through February, most carbohydrates are in the crown, so this is the ideal time to cut canes.

Yield of primocane-fruiting types is influenced mainly by (1) the number of canes per unit area and (2) the number of berries per lateral. Growers can influence the number of canes produced by plants. Since large numbers of canes do not seem to decrease fruit size in the fall crop of primocane-fruiting raspberries, growers should try to produce as many canes per area as possible. This can be done by planting narrow rows and more rows per acre. Row widths of 12-18 inches are considered ideal for harvesting. The distance between rows should be wide enough to allow available equipment to pass. The other factor influencing yield, the number of berries per lateral, generally depends on the particular cultivar being grown. The grower has little control except to choose productive cultivars.

Floricane-Fruiting (summer-bearing) Raspberries and Blackberries

Floricane-fruiting brambles produce fruit only from buds on second-year canes. Unlike primocane-fruiting raspberries, these canes must remain intact throughout the winter and following growing season, until the completion of harvest. Also, during second-year flowering and fruiting on floricanes, new first-year primocanes are growing. These primocanes interfere with spraying and harvesting, shade the leaves and laterals of floricanes, and compete for water since they share a single root system. This interference must be minimized to obtain a high yield of fruit each year. Five general methods of pruning floricane-fruiting brambles are described below. Each method will produce different results in the growth of primocanes and floricanes of floricane-fruiting crops. Also, with the following methods, row widths should be maintained at no greater than 18 inches.

Conventional: No Mowing or Suppression of Primocanes

This training system is traditionally used by bramble growers in the Northeast. Primocanes emerge and are permitted to grow throughout the season. The following year, they become floricanes, flowering and fruiting as new primocanes. Immediately after fruiting, however, the floricanes are cut at ground level and destroyed. Some carbohydrates are lost by cutting canes in summer. However, this loss is offset by the advantages of reduced disease inoculum and a reduction in dormant season pruning. In early spring, all remaining canes are topped (headed back) to a convenient height for picking, since little vegetative growth occurs in the second season. Canes are thinned to a desired number, usually 3-4 canes per square foot. When thinning, the most vigorous canes should be selected to produce the next crop -- those with good height, a large diameter, and no visible symptoms of disease, insect damage, or winter injury.

Alternate Year Mowing

Primocane interference among floricanes is reduced by alternately mowing half of the planting to the ground each year during the dormant season. In the spring after mowing, primocanes will emerge and grow without interference from fruiting canes. The following year, the floricanes will flower and fruit. Although primocanes will also grow in the fruiting year, all canes will be cut to the ground during the next dormant season. Advantages of this method are that no detailed cane thinning or pruning is required, and spray material costs are reduced approximately 50%. Disadvantages include a reduction in fruit quality, berry size, and yield of approximately 30% for most cultivars, since only half the planting is fruiting in any one year.

Mowing with Primocane Suppression

The reduction in yield caused by alternate year mowing can be recovered over the short-term by removing all primocanes from the plant row during the fruiting year. The elimination of primocanes after they begin growth is called "suppression." After the first few flushes of growth are removed, primocanes eventually will be allowed to grow. A system that involves mowing in one year, followed by primocane suppression in the second year, is truly biennial -- primocanes grow without

interference from floricanes, and floricanes grow without interference from primocanes. Removing primocanes, however, is not easy. Dinitrophenol products can no longer be used, so growers must find other ways to remove primocanes until new products are developed. Some growers have reported success with Gramoxone, Scythe and Goal. The advantages of this method are the ease of pruning when done in early spring, and a reduction in spray materials cost. Disadvantages are a reduction in yield over the long-term, since only half the planting is fruiting in any one year, and the cost of primocane suppression (labor, materials).

Primocane Suppression without Mowing

The highest long-term yields and largest berry sizes have resulted from a combination of selective floricane thinning and suppression of primocanes in late. If primocanes are suppressed when 6-8 inches tall, shading on the lower portions of floricanes is reduced. Harvesting is easier because smaller primocanes cause less interference. Primocane suppression has also been reported to increase hardiness. Since there is less shading and fewer demands for water, fruit size and productivity of lower laterals are increased. Primocanes of vigorous cultivars can still grow to a sufficient height for adequate fruiting the following year.

Primocanes should not be suppressed until the planting is at least three years old. Primocanes contribute large amounts of carbohydrates to the bramble plant, and repeated suppression will reduce carbohydrate levels. Therefore, suppression should be skipped every third or fourth year to allow the planting to recover from the general reduction in vigor. Weak hills or sections of rows should not be suppressed at all. There are conditions under which suppression of primocanes is not recommended. If a fruit crop load is particularly heavy, primocane growth may decrease naturally as developing fruit demands all the plant resources. Also, if primocanes are suppressed in regions with short growing seasons, they may be too short at the end of the growing season. Suppression is not recommended under the above conditions, or whenever the plant is stressed, such as from a lack of moisture or a nutritional imbalance.

Advantages of primocane suppression are: (1) increases in fruit size and quality, (2) increases in production, and (3) reduced cane numbers. Disadvantages are: (1) long-term reductions in stand vigor and (2) expenses involved with primocane suppression or elimination.

Partial Primocane Suppression

Yield and quality may be increased without suppressing all the primocanes in a planting. Removing all but 4 or 5 primocanes per linear foot of row will increase yield and fruit quality in floricanes of some cultivars. For this method, growers select the primocanes in late spring which will be carried into the following year for fruiting. Rejected primocanes are cut to ground level when 8 inches tall. The raspberry plant uses resources for the current fruiting canes and the remaining primocanes, rather than for many primocanes which would eventually be removed. Primocane regrowth is ignored until the dormant season when these short canes are removed. Advantages of this system are: (1) selected primocanes grow for an entire season instead of the partial season permitted in complete primocane suppression, (2) rejected primocanes are removed when small, succulent, and easy to handle, as opposed to large and thorny, and (3) fruit size and quantity of current season is increased. The major disadvantages are: (1) primocane selection is difficult when leaves are on the plant, and (2) suppression of undesirable canes requires much labor. For more information on blueberry production visit Marvin Pritts' course information site at http://courseinfo.cit.cornell.edu/courses/HORT442/. Use "guest" / "guest" as your login and password!

Matted-Row Strawberry Cultivar Trial Notes, 2002-2003

Kathy Demchak, Department of Horticulture, Pennsylvania State University, State College, PA.

Twenty-eight cultivars or advanced selections of June-bearing strawberries were planted in the spring of 2002 at Penn State's Horticulture Research Farm, and harvested for the first time in 2003. Twenty-four of these were relatively new, while four, 'Earliglow', 'Honeoye', 'Allstar' and 'Jewel', were included as standards for comparison. Plants were grown according to standard recommendations, except that insecticide and fungicide sprays were minimal. The peak harvest season was delayed by 7-10 days from 'normal' and was sometimes different than that expected. Cultivars and selections included, grouped according to their peak harvest season in 2003 were:

SEASON	PEAK YIELD	CULTIVARS
Early season	June 16-23	ByV1, Earliglow, Evangeline, MNUS 138, and Sable
Early-mid season	June 20-30	Bish, Chambly, Honeoye, Mira, MNUS 694, and Primetime
Mid-season	June 23 to July 2	Allstar, Brunswick, Darselect, L'Authentique Orléans & Mesabi
Mid-late season	June 25 to July 5	Cabot, Eros, Jewel, L'Acadie, St. Pierre, and Winona
Late season	June 30 to July 9	Idea, Ovation, St. Laurent d'Orltans and Yamaska

L'Amour and Clancy were included, but due to small original plant size and a late start on establishment, yield data will be compared to other cultivars only in 2004. A final grouping will be decided after a second harvest season in 2004, and may be different from that presented here. All yields presented below are marketable yields. For reference, marketable yields for the entire experiment ranged from a low of 6,726 lb/A for Yamaska to 20,793 lb/A for Honeoye. Percent marketable fruit ranged from 70.9% for L'Acadie to 84.8% for Yamaska. Mean berry weight over the entire season ranged from 8.5g for Sable to 18.3g for Cabot.

Results

Since 2003 was only the first harvest year, results are somewhat preliminary. However, growers may be interested in these results as they make decisions concerning cultivars to try this spring. Out of the 5 early season cultivars tested, Earliglow had the next-to-lowest marketable yields (11,493 lb/A), and berry size was small (9.6 g/berry average over the season), but considering flavor, color, and firmness, it's still difficult to recommend any others over it. ByV1 was bred for plasticulture, and came out of dormancy too early, resulting in low yields. Evangeline yields and berry size were similar to that of Earliglow. Evangeline's berries were small, but attractive, with a rich color, consistent size and shape, and flawless caps. MNUS 138 produced the highest yields (19,634 lb/A), yielded for a longer time than most, and had large berries for an early cultivar (12.1 g), but they were soft and the flavor was a bit flat. Sable was second highest in yields (16,383 lb/A), but the berries were the smallest for all of the early-season cultivars (8.5 g), and were sweet but missing complexity. Sable plants hug the ground closely.

Among the early-mid season cultivars, Bish had excellent flavor, but like ByV1, was bred for plasticulture and came out of dormancy too early resulting in low yields. However, in this environment, it runnered and filled in the rows as well as matted-row cultivars. Chambly was average and Mira did not perform well. Honeoye produced the highest marketable yields for this category and the entire experiment (20,793 lb/A), and had good flavor and size, but berries became too dark later in the season. MNUS 694 produced the second highest yields (17,535 lb/A), and like MNUS 138, produced over a long season and had large berries that were a bit flat. Primetime was a surprise. Growers had been disappointed with its yields, but here it produced well (16,367 lb/A marketable fruit), and had the largest berries for the group (12.8 g/berry) with good flavor. Maybe it just needs a lot of water, or a lot of snow cover.

In the mid-season category, Mesabi was the highest producer of marketable yields (20,766 lb/A). Negatives are that it tends to develop a very dark color, is a bit soft, and is quite susceptible to sunscald. Allstar and Brunswick produced similarly (14,115 and 15,722 lb/A respectively), but berry quality and flavor was not notable for either one. Darselect yields were on the low side (12,021 lb/A), but size and flavor were the best for the category. It was also susceptible to leaf diseases and leafhoppers, though these were easily controlled. L'Authentique Orléans yields were low.

There was a narrow range of yields among the 6 mid-late season cultivars tested, ranging from a low of 12,096 for St. Pierre to a high of 16,092 lb/A for Cabot. Cabot was the most interesting. Its first fruit averaged 40 g (the size of a small peach), and were oddly-shaped. However, fruit quickly became normal in appearance, though large. Cabot produced very few runners, so might be worth trying in plasticulture. Flavor and firmness was good. Marketable yields of Eros were good (14,712 lb/A), berries were large (14.0 g) but soft, and had a light color, making it difficult to judge when they were ripe. Berries started ripening at the tip, and often remained white near the cap. Jewel, the standard, was average with sour-tasting berries. L'Acadie was the highest producer of total yields for the category, but many fruit were unmarketable due to the bottoms of the fruit splitting open. St. Pierre has Chandler and Jewel for parents, and was a favorite for flavor. However, its fruit is light when ripe, being somewhat peach-colored. The fruit has a nice shape, and gorgeous light green caps that complement the fruit color perfectly, making it amazingly attractive for a light berry. Winona produced its berries on short pedicels, so fruit tended to hug the ground. The pedicels (stems) on the berries broke off at the plant end rather than the cap end, so many stems remained attached.

Late-season cultivars extended the season beyond that normally considered late. All were low-yielding, so apparently high yields are sacrificed for season-extension. Idea, while producing the highest yields in this category (12, 346 lb/A), had berries that were light, soft, and oddly shaped, though flavor was good. Ovation had the best flavor and appearance for the group, though yields were on the low side (9,185 lb/A), especially considering the amount of foliage it produced. St. Laurent d'Orltans produced decent yields, but bottoms of fruit tended to split open. Yamaska produced low yields and was not well-adapted to this climate.

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Check out the NYSAES Tree Fruit and Berry Pathology web site at:

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