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SPECIAL REPORTS:

Sensation ™ Brand 'Florida127' Strawberry

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'Florida127' (U.S. PPAF) is a new strawberry cultivar released from the University of Florida in 2013, the fruit of which are eligible for marketing under the Sensation[™] brand. This cultivar was originally trialed as breeding selection FL 09-127. 'Florida127' originated from a 2009 cross between WinterStar™ 'FL 05-107' (female parent) and unreleased breeding selection FL 02-58 (male parent). It has been tested over several years in field plots at the University of Florida Gulf Coast Research and Education Center (GCREC, Balm, FL), at the Florida Strawberry Growers Association (FSGA) headquarters in Dover, FL and on several commercial farms. Data from these trials have been used to generate the following information and recommendations to help growers obtain optimum performance of this cultivar in westcentral Florida.

Comparisons are made to the current industry standard cultivar 'Florida Radiance' (Chandler et al., 2009) and also to 'Strawberry Festival'

(Chandler et al., 2000) for some disease resistance comparisons.



Figure1: 'Florida 127' growing in Dover, FL.

Fruit and Plant Characteristics

'Florida127' is a short-day plant adapted to annual, winter plasticulture growing systems. The plant is moderately compact, robust and upright with long pedicels, making the fruit easy to harvest (Fig. 1). It produces conic to broadconic fruit that are uniform in shape throughout the season, resulting in few non- marketable fruit. A small internal cavity has been observed in some primary fruits, but rarely in secondary or tertiary fruits.

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Strawberry Seasonal Checklist

Fruit size is very large, exceeding that of 'Florida Radiance' on average over the course of the season. Fruit firmness is slightly greater than that of 'Florida Radiance', with excellent shelf life. The resistance of 'Florida127' to water damage is less than 'Florida Radiance', with some cracking of ripe fruit observed and/or a pale, water-soaked spot when standing in water on top of the plastic mulch. While cull fruit due to water damage have been greater for 'Florida127' than for 'Florida Radiance', cull fruit due to small size have been lower, resulting in overall lower cull rates for 'Florida127'.

The external color of the fruit is bright red that appears lighter than 'Florida Radiance' and does not darken overly late in the season (Fig. 2). Since the fruit is firm and develops external color gradually, growers should adjust picking schedules to allow optimum external color development. We estimate that the picking interval should be one day longer for 'Florida127' than for 'Florida Radiance' at most points during the season.



Figure 2: 'Florida127' has larger size and lighter color than other Florida varieties, and growers are encouraged to adjust picking schedules to obtain optimum color.

The ripe fruit of 'Florida127' have excellent flavor and aroma. Soluble solids contents of 'Florida127' fruit were significantly higher than that of 'Florida Radiance' on six out of seven harvest dates tested. Titratable acidity was not significantly different from 'Florida Radiance'.

Field Performance

Early and total season yields of 'Florida127'

have been very similar to 'Florida Radiance' in multiple years of testing, both in experimental and on- farm trials. When planted early in the planting period, no overly-elongated fruit have been observed, in contrast to 'Florida Radiance' which can produce elongated fruit when planted early in west-central Florida and exposed to hot weather in October and early November. 'Florida127' planted between September 25 and October 1 has performed very well in GCREC field plots. Growers are encouraged to experiment with planting dates between September 25 and October 10. Because this variety is more vigorous than 'Florida Radiance' in-row spacing of 15-16 inches is recommended, especially at early planting dates.

Fertilization

Field studies and observations suggest that 'Florida127' does not require as much nitrogen (N) fertilization during the first few weeks of establishment and growth as 'Florida Radiance' in order to produce high early and total yields. This variety also appears to respond more strongly to N application in terms of vegetative growth compared to 'Florida Radiance.' Growers should therefore carefully monitor N fertilization to prevent excess growth, particularly early in the season. For this reason, pre-plant N fertilization is not recommended. Previous research has indicated that other Florida cultivars do not require pre-plant N fertilization (see

http://edis.ifas.ufl.edu/pdffiles/HS/HS37000.pdf), and it is expected that 'Florida127' will follow the same pattern. In mid- to late-season, 'Florida127' should be able to tolerate higher N rates than 'Florida Radiance' due to its higher fruit firmness, and rates of 1 lb N/ acre/day should usually be possible without negatively impacting fruit quality.

Disease Management

'Florida127' is considered highly resistant to *Colletotrichum acutatum* (causal agent of anthracnose fruit rot), similar to 'Florida Radiance' (Seijo et al., 2011). More information about anthracnose can be found at: http://edis.ifas.ufl.edu/pdffiles/PP/PP13000.pdf. 'Florida127' may be more susceptible to Botrytis fruit rot than 'Florida Radiance' based on observations of grower trials, though in GCREC trials the two varieties are not significantly different for Botrytis incidence (see http://edis.ifas.ufl.edu/pdffiles/ PP/PP15200.pdf for more information on Botrytis).

Plant size management is a key for Botrytis resistance, with overgrown plants trapping moisture and humidity that promotes epidemics. Therefore careful monitoring of N fertilization, particularly early in the season and on soils with higher organic matter, is crucial.

Fungicide applications for the control of Botrytis fruit rot should target the peak bloom periods. As for all varieties, applications of Switch should be reserved for environmental conditions that are highly conducive for Botrytis. A web-based disease forecast system to aid growers on timing of fungicide applications for control of anthracnose and Botrytis fruit rots has been developed and is available at http://agroclimate.org/tools/ strawberry/. More information on the system is available at:

http://edis.ifas.ufl.edu/pdffiles/AE/AE45000.pdf.

Early indications from naturally infected trials indicate that 'Florida127' is more susceptible to Podosphaera aphanis (causal agent of powdery mildew disease) than other Florida varieties. Early control at the first sign of foliar signs or symptoms is recommended. Based on inoculated trials, 'Florida127' is highly susceptible to crown and root rots caused by Phytophthora cactorum. Thus, fruit growers are strongly encouraged to take the same precautions against P. cactorum infection as they would for 'Florida Radiance'. Metalaxyl, the active ingredient in Ridomil Gold[®], is highly effective and should be injected through the drip tape as soon as plants are established. Two applications may be needed to treat an infected crop. Products

containing potassium phosphite or potassium salts of phosphorus acid are alternatives that should generally be applied as foliar sprays, although some are also labeled for drip application. Members of this group are not curative and multiple applications may be needed beginning immediately after plant establishment. Early season plant collapse can also be caused by Colletotrichum gloeosporioides (causal agent of Colletotrichum crown rot) and Macrophomina phaseolina (causal agent of charcoal rot) and symptoms are virtually indistinguishable to those of Phytophthora crown rot. Inoculated trials indicate that 'Florida127' is more resistant to Colletotrichum crown rot than 'Florida Radiance' (Seijo et al., 2014) and has similar resistance to charcoal rot. To identify the causal agent of plant wilt and collapse, growers are encouraged to submit a sample to the UF Plant Diagnostic Lab at GCREC where the pathogen will be isolated and identified, and control recommendations will be provided.

Summary

'Florida127' is a promising new cultivar for west-central Florida growers due to its early yield, robust plant habit, and its excellent fruit size and eating quality. Based on research trials at the GCREC and in commercial fields, the following main recommendations can be made:

Growers can experiment with early planting dates for this variety to maximize early profits.

Due to the lighter external color of the fruit compared to current cultivars, picking schedules must be adjusted accordingly.

Priorities for disease management for this variety are Botrytis fruit rot, Phytophthora root rot and powdery mildew. Resistance to other fungal diseases is considered moderate to high.

Careful management of N fertilization is recommended to achieve optimum plant size

and density (which is key in managing Botrytis fruit rot) and high fruit quality.

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Biology and Management of Green Kyllinga (Kyllinga brevifolia)

Nathan S. Boyd, UF/IFAS Gulf Coast Research

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Species Description

Green kyllinga (Kyllinga brevifolia) is a perennial sedge that likely originated in Asia. It is a

common weed of turf and in recent years has become problematic in strawberry fields in Florida. Within plasticulture production systems, its occurrence is limited to row middles (Fig. 1) and planting holes because unlike purple and vellow nutsedge it cannot penetrate the plastic mulch. Stem height is highly variable but the culm or stem is typically triangular with two to five grass-like leaves near the base of the shoot that fold tightly around the stem. The inflorescence (group of flowers) occurs at the end of the stem, is green, and generally cylindrical or dome-shaped (Fig.2). There are two to four leaf-like bracts at the base of the inflorescence that spread out perpendicular to the stem.

Each inflorescence, typically called a spike, is composed of multiple spikelets with an average seed production of 100 seeds per spike. There are other kyllinga species that occur in Florida that are largely differentiated by the floral structure. Only green kyllinga and false green kyllinga (Kyllinga gracillima) spread via rhizomes. The inflorescence of green kyllinga tends to be smaller than false green kyllinga with toothed scale keels and 1-2 stamens per flower versus the smooth scale keels and 2- 3 stamens per flower observed in false green kylinga (Bryson et al. 1997).



Figure 1: Green Kyllinga in the row middle in a strawberry field (L) and up close (R).

Green kyllinga spreads via seeds and rhizomes. It tends to become established in wet conditions with full sun but once established can spread to drier areas and areas with limited shade. Shoots are closely spaced on the rhizome (Figure 3) and as a result the plant tends to appear in dense clumps. The plant also produces prolific numbers of small seeds that disperse over very short distances when unassisted by other mechanisms. There is currently no information on seed bank longevity in commercial fields in Florida but we do know that viability is typically high. Seeds only germinate when they are very near the soil surface and prefer temperatures between 68 and 75 F (Molin et al. 1997) which means germination is likely to be greater during the fall and winter months.



Figure 2: Green kyllinga spikes. Note the cylindrical shape of the spikes and leaf-like bracts at the base.



Figure 3: Green kyllinga rhizomes with closely spaced shoots.

Management

The first step in any management program should be prevention which includes removal of problem areas. For example, field leveling and drainage can minimize the number of localized wet areas where this species tends to become established. Steps should also be taken to minimize spread on equipment. This may include washing equipment after working in fields where green kyllinga occurs as it reproduces and spreads readily via seeds and rhizomes which can move on farm implements. New patches should be eliminated as quickly as possible before the species becomes established. There are a range of management options once green kyllinga becomes established in a field. Hand removal may be an option if the population is localized. Fumigants may control green kyllinga rhizomes and seeds but efficacy will depend on the fumigant selected and injection method. Pre-emergence applications of s-metolachlor (Dual Magnum) provide excellent control of germinating seedlings but will not control established plants. Post emergence applications of glyphosate tend not to provide adequate levels of control. Halosulfuron (Sandea) suppresses green kyllinga but sequential applications 4-7 weeks apart are needed to achieve 50-80% suppression.

Trifloxysulfuron (Envoke) provides good control of green kyllinga especially when the herbicide is absorbed by the roots and the leaves. Control will be reduced when the stand is dense and the foliage intercepts all of the applied herbicide (Gannon et al. 2012). None of the above listed herbicides except glyphosate are currently registered for use in strawberry where this weed has most frequently been observed. Management options are limited to herbicide applications during fallow periods, maximum label rates of glyphosate applied to row middles only, and hand pulling.

Please note that the herbicide

recommendations listed above are general in nature and the listed active ingredients are not registered on many vegetable crops. The use of trade names is solely for the purpose of providing specific information. It is not a guarantee or warranty of the products names, and does not signify that they are approved to the exclusion of other suitable products. Be sure to read and follow all herbicide labels prior to application.

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Evaluation of lime sulfur and Sulforix for control of Exobasidium leaf and fruit spot disease of blueberry

Phil Brannen, Shane Curry, Charlie Drury, Phillip Edwards, Leigh Ann Fall, Renee Holland, James Jacobs, Josh Neuman, Drew Payton, Ben Shirley, Jeremy Taylor, and Tim Varnedore

Exobasidium fruit and leaf spot, caused by the fungus Exobasidium maculosum, is an emerging disease affecting both southern highbush and rabbiteve blueberries. Fruit symptoms include circular lesions which may be sunken and tinged with red color, diseased fruit tissue which is generally green and unripe, and sparse white fungal growth on spots. Leaf spots are light green on the upper side of the leaf and white on the underside, due to a thin layer of fungal growth (Fig. 1); leaf spots become necrotic (dried and brown) with age. Fruit lesions compromise the aesthetic qualities of the fruit, as well as the taste, rendering berries unmarketable. As a result, packing lines have to slow down to allow human sorters time to remove fruit with lesions, thereby increasing production costs. Even with this added effort, affected fruit are still able to make it into the package - increasing customer complaints.



Figure 1: Symptoms of Exobasidium fruit (A) and leaf spot (B). Fruit symptoms are green, firm spots and blotches that do not mature with the rest of the berry. Leaf symptoms are light green spots on the upper leaf surface which are white or lighter green on the lower surface.

In 2014, fungicides were evaluated for control of Exobasidium on the rabbiteye cultivar 'Premier' in the south Georgia counties of Appling, Bacon (3 locations), Clinch, Irwin, and Jeff Davis. Treatments included lime sulfur (5 gal/A), Sulforix (2 gal/A) or Captan 4L (2.5 gt/A; Bacon County locations only) applied at a late-dormant phenology (plant growth stage) with an airblast sprayer (~70 gallons/A total solution); no additional fungicides were applied. At least four replications of each treatment and the untreated control were applied to a randomized complete block design, with each plot consisting of ten plants: the outer two plants in each plot were considered to be buffers and were not utilized for treatment evaluation. All cultural practices were in keeping with rabbiteye blueberry production methods commonly observed in the Southeast. Leaf disease incidence was recorded from 13 May to 16 May with ~ 200

leaves per plot. Mature fruit were collected from 30 May to 10 June, and disease incidence was assessed on ~300 fruit per plot.

Rainfall was more than adequate for disease development, with an average of 15% of the leaves and 16% of the fruit showing symptoms in the untreated control. The single late-dormant application of either lime sulfur or Sulforix provided substantial and statistically equivalent management of Exobasidium, whereas Captan was not effective. The epidemiology of E. maculosum has not been elucidated, but the high level of disease control afforded with both Sulforix and lime sulfur may indicate that overwintering inoculum and/or early-season infections are of primary importance to disease development. The difference in efficacy between lime sulfur and Sulforix was diminutive. but Sulforix consistently outperformed lime

sulfur with the exception of fruit spot incidence in Clinch County.

Based on the results obtained this year, we recommend that Sulforix be utilized for a latedormant application as a component in a comprehensive management program for suppression of Exobasidium. Lime sulfur is still the product of choice for organic production, since Sulforix is not an organic product. As a result of this successful research project, we expect yields/pack-out to increase and consumer complaints to decrease in 2015. We will discuss a full-management program for Exobasidium in the winter blueberry meetings. In the interim, please contact your local county agent if you have pressing questions relative management of this disease.

Table 1: Exobasidium leaf and fruit spot incidence following treatment with lime sulfur, Sulforix or Captan.

				Leaf spot in	cidence ^y		
Treatment and rate/A ^z	Appling County	Bacon County Site 1	Bacon County Site 2	Bacon County Site 3	Clinch County	Irwin County	Jeff Davis County
Untreated control	2.6 a	25.0 a	20.7 a	9.7 a	16.0 a	20.1 a	5.7 a
Lime Sulfur (5 gal)	0.7 ab	4.1 b	4.2 b	2.5 b	0.9 b	2.2 b	0.2 b
Sulforix (2 gal)	0.4 b	3.3 b	4.0 b	2.1 b	0.5 b	1.6 b	0.1 b
Captan 4L (2.5 qt)	N/A	27.42 a	16.52 a	6.62 a	N/A	N/A	N/A
LSD (a=0.05)	1.9	5.7	4.2	3.6	9.3	13.5	2.5

				Fruit spo	t incidence ^x		
Treatment and Rate/A	Appling County	Bacon County Site 1	Bacon County Site 2	Bacon County Site 3	Clinch County	Irwin County	Jeff Davis County
Untreated Control	2.3 a	14.3 a	15.4 a	13.3 a	8.1 a	27.3 a	31.8 a
Lime Sulfur (5 gal)	1.6 a	1.6 b	2.1 b	1.8 c	0.5 b	3.0 b	0.5 b
Sulforix (2 gal)	1.3 a	1.0 b	1.1 b	0.7 c	0.7 b	2.1 b	0.3 b
Captan 4L (2.5 qt)	N/A	13.8 a	13.4 a	7.2 b	N/A	N/A	N/A
LSD (a=0.05)	1.5	4.0	5.0	3.2	2.5	7.4	14.3

^zTreatments were single late-dormant applications between Jan 17 and Feb 15, depending on location.

^yRecorded for 20 shoots per plot with ~10 leaves per shoot on average. Means followed by the same letter are not significantly different when using Fisher's protected LSD test ($P \le 0.05$).

^xRecorded for ~300 fruit per plot on average. Means followed by the same letter are not significantly different when using Fisher's protected LSD test ($P \le 0.05$).

Organic Strawberry Research Gets \$200,000 Boost From Walmart

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With an additional \$200,000 grant from the Walmart Foundation, scientists from the University of Florida and North Carolina A&T University are expanding grower engagement in organic strawberry research.

While the focus of the 2013-2014 work was broad and exploratory, a key component of this year's research will be to test the best aspects of the organic strawberry production system under farm conditions and with grower management.



UF/IFAS researcher Vance Whitaker (left) and Gerald Hubbell with JMAK Farms participate in a review of strawberry plants in Plant City. Photo courtesy of UF/IFAS

Growers at three farms in North Central Florida are assessing two cover crops and three

commercial strawberry cultivars that performed well in last year's Phase I trials. Grower evaluations of the Phase I research resulted in suggestions that researchers assess cover crop combinations as well as a cover crop that could produce a marketable product.

In Phase II, scientists will evaluate the onstation and on-farm research for seasonal variability in market yield, nutrient-use efficiency, consumer acceptance and response to postharvest handling and storage. Last year, two types of strawberry-growing systems were tested in North Carolina and Florida, one in open fields and one in a high tunnel. This approach allowed researchers to answer the kinds of questions that organic and conventional growers commonly face about how a change in one component of a farming system will affect other elements.

Although the high tunnel system tested in the initial study enhanced plant growth, fruit yield and frost protection, growers didn't see it as important. UF researchers then focused on more in-depth studies of selected cultivars in the organic open-field system in Florida. In Phase II, strawberry cultivar evaluation in an organic high tunnel system will continue only at North Carolina A&T University, where 10 cultivars will be evaluated, instead of the eight used last year. Additionally, four strawberry cultivars have been planted in a high tunnel as well as in the open field at the Hmong demonstration site in Lincolnton, North Carolina.

Pest management continues to be a major focus of the research.

Researchers are building on their Phase I work with the Twospotted spider mite and the spotted wing drosophila by investigating the susceptibility of three strawberry cultivars to infestation by the pests.

Since farmers' markets and community supported agriculture are two important channels for small strawberry growers, researchers will conduct a national online consumer survey. It will focus on consumers' preference of strawberry quality attributes and their willingness to pay for them.

In addition to increasing grower participation, researchers expect more engagement of county Extension agents in Phase II. By working with Extension faculty from **Florida A&M University**, minority and limited-resource farmers will be included in research evaluation activities and an on-farm workshop to be organized by **Florida Organic Growers and Consumers Inc**. The Walmart Foundation is funding the research. UF and N.C. A&T received the \$200,000 grant in 2014 in addition to the \$175,000 awarded in 2013 to further evaluate the most promising innovations on area farms in addition to research stations in Florida and North Carolina.

Georgia Is The Top Blueberry State In The Nation

Reprinted from Growing Produce, 11/17/2014

Although Georgia might be called the Peach State, a more accurate nickname would be the Blueberry State. This year, Georgia became the top blueberry producing state in the U.S., according to a news story from The Red and The Black, an independent student newspaper, serving the University of Georgia community.

Blueberry production in Georgia this year is estimated at 96 million pounds, which is up from 5 to 10 million pounds in 1990 says Scott NeSmith, professor and blueberry breeder at the University of Georgia's Griffin Campus.

NeSmith says Georgia will always be known for peaches, even though the state is experiencing exponential growth in blueberries.

"We should always be proud of our peaches. Our peaches are fantastic. It's just that peaches reached their plateau a few years back and blueberries are still growing. Blueberries have put us on the map in a different way," he says.

New Berry Growers Are Innovative

Charlie O'Dell Extension Horticulturist Emeritus for commercial strawberry, blueberry, and vegetable production at Crow's Nest Farm in Blacksburg, VA

Reprinted from Growing Produce, 11/11/2014



In recent years many younger families have decided to become berry growers. Often they have been urbanites who want their families to enjoy the quieter environment of the countryside yet still be commuter-close to their off-

farm jobs. Such locations are ideal places to begin or maintain U-Pick berry farms! Many such folks have begun commercial berry farming, helping to make up for older retiring berry growers, so that urban consumers can continue to be provided the on-farm experiences of visiting and picking their fresh fruit for in-season use and processing, including freezing for year-round use.

In my experience, a majority of these new berry growers have had little to no prior experience growing berries for home use nor commercially, or even any past farming experience. Often it seems they have dreamed of having a farm and earning income from it. Most, it seems, are skilled in some non-agricultural profession, so they are well-equipped to continue their off-farm full or part-time work to support their family along with their berry farming passion.

Working Smarter, Not Just Harder

In this electronic information age, these new, first-time berry growers are quick to locate berry growing information resources, including local and University Extension/research-developed production and marketing information for their area. With no agricultural or horticultural background or training, it seems, they are even more eager to try to find ways to farm smarter, not just harder!

Many hope to produce and market their berries as a part-time business in addition to full-time jobs in order to maintain some semblance of a normal family life. They are more eager than some of us older folks to try new ideas, even ideas they may never have studied nor read about in a textbook or a berry production manual! For example, in this past May issue of American Fruit Grower, in the Berries Column article, I reported about the innovative blackberry growing and pruning system developed by a relatively new berry grower, Robert Hays, in Mississippi. He developed a blackberry trellising system for higher yields and also for summer-only pruning.

New Farmers, No Experience

Last year in a nearby county to us, I noted an older, neglected blueberry farm had been sold to a family having no previous berry growing experience. They planned to renovate an old, high-chill rabbiteye blueberry planting that had not been pruned or cared for during the past several years. These plants had grown to well over 9 to 10 feet tall, and had very many toothick, very large diameter old gray-bark stems producing small-size berries. Nobody I know likes to pick small berries because it is slow, tiresome work to fill containers. U-pick urbanites are in a hurry in today's frenetic world!

There was no evidence of any recent annual renewal pruning at the base of any of the plants. U-pickers would be unable to reach many of the berries from the ground, and berries would be small from no pruning. All of the plants had over 15, even 20 or more stems per plant, not the recommended 8 to 9 stems per plant. Almost no young stems were present to sustain fruiting in future years.

In the fall after leaf-drop, they began to prune to remove many of the oldest, tallest stems, working to cut them out near the ground with very long-handled, heavy duty pruning loppers and pruning saws. They found that trying to get into the base of the plants to cut out the thickly spaced, large diameter old stems was very difficult with their loppers and hand saws.

Innovation

Then, they had an idea of their own, they purchased a small hand-held, 12 volt, lithiumion powered reciprocating saw with 6, 9, and 12 inch length, quick-change, snap-in, specific pruning blades. They found the 12 inch blade was best, allowing basal stem cutting of the very large stems, especially in the crowded center portions! That blade could reach into the thick, crowded center area at the basal portion of the plants and cut large-diameter stems out using just the far tip end of the reciprocating blade without trying to get the larger base of the tool into the thick plant interior. For around \$200, the cost of the small reciprocating saw and blades, they purchased a second one so two people could prune together, further speeding up this task. They found the pruningspecific blades to be very superior to other available "standard" blades for this work.



The owners of Windrush Farm in Newport, VA, purchased a small hand-held, 12 volt, lithium-ion powered reciprocating saw with 9-inch quick-change pruning blades to cut the basal stems of crowded center portions. (Photo credit: Charlie O'Dell)

They purchased high capacity lithium-ion batteries and extra chargers that only require 30 minutes to reach full charge, so that extra batteries could always be kept on hand ready to go. I marveled at how quickly they were able to cut out many of those thick, dense stems that 'infested' those old plants. A fully charged battery allowed about an hour of continuous pruning time on these extra-thick old stems. Stem cutting/removal within 2 inches of ground/crown level is at the optimum zone for crown rejuvenation, resulting in rapid crown reproduction of new, strong stems for future fruiting at easily reached picking heights. They left any younger stems for fruiting the following year, and with this tool, their innovative idea, they were able to finish up pruning the entire planting that fall and winter.

I estimate their 2 acre planting had contained at least 5 acres worth of crowed, old stems before they started pruning late last fall! This small, powerful pruning tool could help blueberry and other fruit growers cut out older, less-fruitful, large-diameter stems or limbs that are tightly crowded, faster and at less cost. Growers can make blueberry basal stem cuts closer to the ground where they should to be made.

Their current late-summer ripening blueberry plants are very susceptible to damage by spotted wing drosophilia fruit flies and brown marmorated stink bugs. They have begun diversification into earlier ripening blueberries and other early summer-ripening berry crops to avoid/reduce fruit losses and the need for repetitive, expensive, control sprays for these imported Asian pests.

I salute Steve Bodtke and his son Jake, and his friends Brent Selby and Taylor Willis at Windrush Farm in Giles County, VA. Their innovative pruning idea has allowed them to begin rehabilitation of their berry farm by working smarter and faster!

Blueberry Cultivar Development at The University of Georgia A Progress Report on Southern Highbush for 2014

D. Scott NeSmith

The UGA Blueberry Cultivar Development Program generates and evaluates hundreds of selections of southern highbush and rabbiteye blueberries each year. The UGA Blueberry Research Farm near Alapaha is the primary field site for evaluating new selections and replicated advanced selections. The following is a brief progress report for select southern highbush trials at Alapaha during 2014.

General Season Overview

The 2014 chill hours (hours < 45 F) from Oct. 1 thru Feb. 15 were 836 for the Alapaha site. This was near normal accumulations (825 hours is 10 year average), but much greater than the previous two years (550 in 2013; 685 in 2012). The spring season heat unit accumulation in 2014 was 762 heat units (base

50 F) from Feb. 15 through May 1, which is less than "normal" since the 10 year average heat units for this period are 831. However, two recent years (2011 and 2012) had extremely high heat unit accumulation from Feb. 15 thru May 1, with 1031 units in 2011, and 1184 units in 2012. Therefore, 2014 resulted in delayed flowering and subsequent ripening, especially when compared to 2011 and 2012. In fact, ripening times overall were 2 weeks or more later in 2014 than in those two years. But, the ripening times for 2014 were not so abnormal when compared to 10 year averages. There was some early season freeze damage experienced in 2014 which primarily affected the earliest flowering selections. Notable minimum temperatures at Alapaha and dates were: 25.2 F on Jan. 30; 28.6 F on Feb. 14; 28.0 F on Feb. 28; 30.7 F on Mar. 14. Comprehensive flowering notes, cropping notes and fruit characteristic evaluations were taken for numerous selections and advanced selections of southern highbush blueberries, along with data for standard cultivars.

Performance of Southern Highbush Replicated Advanced Selections

In the past 6 to 8 years, we have established several Advanced Selection replicated trials at the Alapaha site. These trials have multiple replications of 10 to 15 plants for the Advanced Selections, along with cultivar standards. These trials are a culmination of advanced material from earlier selections trials. and offer a more comprehensive look at performance. This report contains data on trials that are 2, 3, and 4 years old. All trials were started from 1 gallon plants, were grown in soil amended with pine bark, and were irrigated using a single line of drip tape. Overhead irrigation for frost protection is not available. Data presented are a numerical scale, where values range from 1 to 10, with a value of 6.0 or less being considered not commercially acceptable (with the exception of cropping score).

Table 1 shows data for several popular varieties and some UGA Advanced Selections for the 4 year old trial at the Alapaha Farm. Even though 'Star' is still widely grown throughout South Georgia, results show that it lags in performance when compared to many new variety releases, especially with regards to cropping. 'Rebel' remains one of the earliest ripening varieties, but early flowering time requires that the variety be frost protected to maximize production. 'Meadowlark' was a little earlier than 'Rebel', but crop load was very light for this variety. Selection 02-28 was the earliest of all in this trial, and it did manage a reasonable crop load even though it flowered so very early.

The selection has very good fruit quality, and will continue to be looked at for possible utility in the early market. 'Suziblue' continues to look good, although, ripening was later than 'Rebel'. But, 'Suziblue' crop load and flavor were better than 'Rebel'. Selection

TH-925 ripened early this year, but flowered much later than 'Rebel' and 'Star'. This selection merits further observation. 'Farthing' crop load was among the highest in this trial in 2014, but berry color and flavor were only fair, and it ripens later in the season. One of our newest releases, TH-921, ripens at a time similar to 'Farthing', and had a very good crop load, excellent vigor, good overall berry quality, and very good flavor.

TH-921 is part of our new "Southern Misses" series, and is expected to go by the name 'Miss Alice Mae'.



Figure 1: Fruit of TH-921, expected to go by the name 'Miss Alice Mae'.

For late season southern highbush, 'Camellia' continues to perform well, with overall very good berry quality and a good crop load (Table 1). 'Camellia' remains one of the most vigorous southern highbush we have released, and it performs very well year in and out at the Alapaha site. 'Sweetcrisp' had very high berry quality, especially with regards to firmness and flavor, but fell a bit short in crop load, which has

also occurred for this variety in years past. TH-896 is a late season selection with large fruit and it has fruit quality rivaling 'Sweetcrisp'. Plants of TH-896 do grow slowly, however, and further evaluations are needed to determine long-term performance and stability. Other promising late ripening advanced selections include TH-669 and TH-828B. Each of these has various positive attributes and merit further evaluation.

Selection or Variety	Date of 50% Flower	Date of 50% Ripe	Berry Size	Berry Scar	Berry Color	Berry Firmness	Berry Flavor	Crop Load	Plant vigor
Camellia	Mar. 10	May 18	9.3	7.0	8.5	7.5	8.0	7.0	9.8
Rebel	Feb. 28	May 8	7.8	7.0	7.0	7.5	6.5	4.8	8.3
Star	Mar. 3	May 10	7.8	7.0	7.0	7.5	6.8	3.5	8.3
Suziblue	Mar. 4	May 12	7.8	7.2	7.0	7.5	7.0	6.3	7.2
Farthing*	Mar. 6	May 15	7.5	6.9	6.8	7.0	6.8	8.0	7.0
Sweetcrisp*	Mar. 4	May 15	7.5	8.5	7.5	9.0	8.5	4.0	7.5
Meadowlark*	Mar. 3	May 6	8.8	8.0	6.5	8.2	7.5	1.5	7.2
02-28	Feb. 18	May 2	8.5	7.4	7.0	7.5	8.3	4.8	8.9
TH-669	Mar. 6	May 18	7.2	7.5	7.2	7.2	7.0	8.3	9.5
TH-828B	Mar. 13	May 19	8.5	7.5	8.8	7.5	7.3	6.3	7.8
TH-896	Mar. 7	May 17	8.8	8.0	8.2	8.6	8.5	5.0	7.0
TH-921	Mar. 5	May 15	7.5	7.5	7.5	7.5	8.2	7.8	8.8
TH-925	Mar. 11	May 9	8.3	7.2	7.2	7.5	8.3	5.3	9.3

Table 1. Ratings of some fruit and plant characteristics of 4 year old Advanced Selections of southern highbush blueberry along with standard cultivars. Data are from Alapaha during 2014. Plants were established in Fall 2010.

* These varieties are recent Univ. of Florida releases, and there is only one replication of these in the trial.

In a separate trial with 3 year old plants, similar performance was observed for cultivar standards (Table 2), with 'Rebel' being the earliest ripening. 'Star' and 'Suziblue' had similar ripening times, but 'Suziblue' had a better crop load. TH-948 is another new UGA release from the "Southern Misses" series, and is expected to go by the name 'Miss Lilly'. This new release flowers late (almost a full month after 'Rebel' this year), while still ripening fairly early, which hopefully makes it suitable for growing without frost protection. The plant is narrow and very upright, likely being suitable for machine harvesting with proper pruning. TH-948 fruit are large and flavorful.

This 3 year old trial contains several other

notable late ripening Advanced Selections (Table 2). Selection TH-889 flowers and ripens after 'Camellia', and has high quality fruit. The plant is more compact than 'Camellia'. Similarly, TH-940 is later season than 'Camellia', but fruit are marginal with regards to firmness. More testing of these selections are needed. TH-917 is the third new release of the "Southern Misses" series, and is expected to go by the name 'Miss Jackie'. This selection flowers and ripens near the time of 'Camellia', but does have more controlled growth than 'Camellia'. TH-917 should make a very nice companion variety for 'Camellia', and is expected to out perform 'Legacy'.



Figure 2: Fruit of TH-948, expected to go by the name 'Miss Lilly'.

Selection or Variety	Date of 50% Flower	Date of 50% Ripe	Berry Size	Berry Scar	Berry Color	Berry Firmness	Berry Flavor	Crop Load	Plant vigor
Camellia	Mar. 20	May 22	8.3	7.0	8.3	7.3	8.0	5.5	8.5
Rebel	Mar. 2	May 8	7.4	7.3	7.2	7.3	6.3	5.5	7.2
Star	Mar. 5	May 12	7.7	6.9	6.9	7.3	6.9	5.0	7.3
Suziblue	Mar. 6	May 13	8.1	7.1	7.0	7.5	7.0	6.5	8.0
TH-889	Mar. 29	May 25	8.0	7.5	8.5	7.5	7.8	6.0	7.3
TH-917	Mar. 23	May 24	7.8	7.0	7.3	7.4	7.8	6.5	7.3
TH-940	Mar. 22	May 26	8.0	7.0	8.0	6.8	7.5	7.5	8.8
TH-948	Apr. 2	May 18	8.5	7.3	7.3	7.4	8.0	6.5	9.9
TH-1008	Mar. 6	May 17	8.5	7.5	7.5	7.5	7.5	6.0	7.8

Table 2. Ratings of some fruit and plant characteristics of 3 year old Advanced Selections of southern highbush blueberry along with standard cultivars. Data are from Alapaha during 2014. Plants were established in Fall 2011.

In the 2 year old Advanced Selection trial (Table 3) there are several early ripening selections. These are all young plants, so they tended to flower later overall than plants in the 3 and 4 year old trials. 'Georgia Dawn' was released in 2012, and it continues to be very early ripening. In this trial, 'Georgia Dawn' ripened about a week earlier than 'Rebel', but it also flowered earlier as well. More than 50% of the 'Georgia Dawn' early crop was lost to freezes. Frost protection is absolutely recommended for production of this variety. But, if frost protection is successful, 'Georgia Dawn' offers the potential for very early fruit. Advanced Selections TH-944, TH-1111, and TH-1125 all had fruit that ripened earlier than 'Rebel', but 'Rebel' yields were very good for young plants (Fig. 4). Harvest from 'Rebel' plants totaled around 2100 g per plant (4.5 lbs), whereas, the others were 1000 to 1300 g (2 to 3 lbs). Selections TH-1111 and TH-1125 did have high quality fruit with regards to firmness and flavor, however, and they had great plant vigor. These Advanced Selections need further observations to see how they progress as plants mature.



Figure 3: Fruit of TH-917, expected to go by the name 'Miss Jackie'.

Table 3: Ratings of some fruit and plant characteristics of 2 year old Advanced Selections of southern highbush blueberry along with standard cultivars. Data are from Alapaha during 2014. Plants were established in Fall 2012.

ection or Variety	ate of 50% Flower	Date of 50% Ripe	Berry Size	Berry Scar	Berry Color	Berry Firmness	Berry Flavor	Crop Load	Plant vigor
Georgia Dawn	Feb. 26	May 3	7.0	7.0	7.0	7.0	8.0	4.5	7.5
Rebel	Mar. 5	May 11	7.5	7.0	7.0	7.2	6.5	6.5	8.2
Star	Mar. 7	May 13	7.8	6.7	6.9	7.3	7.0	5.8	6.8
Suziblue	Mar. 8	May 14	8.5	7.3	7.0	7.8	7.3	6.0	7.5
TH-944	Mar. 2	May 8	8.0	7.0	7.0	7.0	7.0	4.5	8.3
TH-1091	Mar. 4	May 11	7.3	7.0	6.8	7.2	7.2	5.5	8.5
TH-1111	Mar. 8	May 9	7.8	7.0	7.0	8.5	8.7	5.5	9.2
TH-1125	Mar. 5	May 9	8.2	7.0	7.0	8.3	7.8	6.0	8.5



Figure 4: Yields of 2 year old plants at Alapaha during 2014

New Southern Highbush Selections of Interest

In addition to the Advanced Selection trials, we

also have several hundred new selections (less than 4 years old) growing in nonreplicated smaller trials at the Alapaha Farm. Data for several of these selections and some cultivar standards from a 3 year old trial are presented in Table 4. We continue to look for improved varieties with regards to a number of traits, including: early ripening material (TH-1241, TH-1314, TH- 1321), improved berry size (TH-1303, TH-1305, TH-1321, TH-1365), good berry quality (TH-1241, TH-1277, TH-1303, TH-1304, TH-1305, TH-1321), and strong plant vigor

(TH-1247, TH-1249, TH1304, TH-1305, TH-1356). These new selections will be evaluated further in the next 3 years. We have already propagated several of these to start new Advanced Selection trials. Also, we continue to generate 200 to 300 new selections of blueberries each year.

Our goal is to provide relevant material to help improve and sustain the southern highbush industry for years to co

Selection or Variety	Date of 50% Flower	Date of 50% Ripe	Berry Size	Berry Scar	Berry Color	Berry Firmness	Berry Flavor	Crop Load	Plant vigor
Camellia	Mar. 11	May 19	9.2	7.0	8.5	7.5	8.0	5.5	9.0
Rebel	Feb. 25	May 6	8.5	7.5	7.5	7.5	6.5	5.5	7.5
Star	Mar. 3	May 8	7.5	7.0	7.0	7.5	7.0	4.5	6.8
Suziblue	Mar. 3	May 11	8.0	8.0	7.0	8.0	7.0	5.5	7.5
TH-1241	Mar. 6	May 3	8.5	7.3	8.0	7.8	8.5	5.0	7.3
TH-1247	Mar. 5	May 13	7.5	7.5	7.0	7.5	8.0	8.0	8.5
TH-1249	Mar. 21	May 23	7.3	7.0	7.5	7.5	7.5	8.0	9.0
TH-1277	Mar. 6	May 15	6.8	8.3	7.0	8.3	8.3	8.0	7.5
TH-1303	Mar. 10	May 9	8.8	7.5	8.3	8.5	7.8	2.5	8.0
TH-1304	Mar. 8	May 5	8.5	6.8	8.0	8.0	8.0	5.0	8.5
TH-1305	Mar. 12	May 15	9.2	7.0	8.0	8.0	8.0	7.3	9.9
TH-1314	Feb. 26	May 3	8.0	7.5	8.5	8.5	7.5	4.5	7.5
TH-1321	Feb. 18	May 1	9.0	7.0	7.0	8.5	8.5	1.5	7.5
TH-1327	Feb. 18	April 29	8.5	7.3	7.5	8.0	7.5	2.5	7.0
TH-1333	Feb. 23	May 7	8.5	7.0	7.5	7.5	7.0	4.5	7.5
TH-1356	Mar. 2	May 6	7.5	7.5	8.5	8.0	7.0	7.5	9.5
TH-1365	April 3	May 27	9.0	6.8	8.0	8.0	8.0	6.0	8.0

Table 4. Ratings of some fruit and plant characteristics of 3 year old new Selections of southern highbush blueberry along with standard cultivars. Data are from Alapaha during 2014. Plants were established in Fall 2011.

UGA Blueberry Varieties' Availability and Licensing

Plant licensing for the "Southern Misses" varieties is underway, and limited availability is expected by Fall 2015. More specific information about these new varieties will be forthcoming. For information on UGA

Blueberry licenses, contact UGA's Technology Commercialization Office at 706-542-5942. Also, visit <u>GeorgiaCultivars.com</u>.

Disease and Resistance Management in Strawberry; Top Considerations for the Coming Season

Guido Schnabel (Clemson University) and Natalia Peres (University of Florida)

The new strawberry season is just around the corner and we need to make smart choices for pest and disease management. At the Strawberry Expo 2014 in Pinehurst we talked

about some important things to consider this coming season to ensure maximum disease and resistance management. Here they are in a nutshell:

Implement IPM practices in nurseries. It is not a secret that diseases often come in with transplants and we must do a better job avoiding that. Luckily, we received some funding that will enable us to work with nurseries, investigate their practices, and develop solutions to current problems. This will not happen overnight but will rather be work in progress over the next years.

Avoid Key Selectors. Some fungicides are key selectors for resistance to multiple fungicides in the gray mold fungus on the east coast. Resistance to multiple fungicides has built up in a stepwise fashion over time and resistance to some fungicides is the backbone of resistance to newer chemistries. Basically, if new resistance emerges, it is most often from a population that is already resistant to established fungicides. In particular, applications of fungicides from FRAC (Fungicide Resistance Action Committee) group 1 (e.g. Topsin M) and to some degree FRAC 11 (Abound, Cabrio, Pristine, Merivon) are frequently associated with resistance to other FRAC groups that we need for disease control.

Our recommendation:

- Avoid FRAC 1 fungicides
- Use FRAC 7/11 premixtures (Merivon, Pristine) ONLY if gray mold AND anthracnose are a threat BUT NOT for routine gray mold control.
- Use FRAC 11 solo products (Abound, Cabrio) only for anthracnose control
- Do not use FRAC 7/11 premixtures or FRAC 11 solo products more than twice per season.

Spray Strategically. If applications are needed prior to bloom, thiram, captan, and maybe biologicals should be used. During bloom, stick

with captan as much as possible and use the 'at risk fungicides' (including FRAC 1, 2, 7, 9, 11, 12, and 17) only when the weather is favorable for disease development (Table 1).

Table 1: FRAC code, trade name, and primarytarget of fungicides frequently used for diseasecontrol in strawberry

FRAC Code	Trade Name Examples	Primary Target
1	Topsin M	Gray mold
2	Rovral	Gray mold
7	Fontelis	Gray mold
7/11	Pristine	Gray mold and anthracnose
	Merivon	Gray mold and anthracnose
9	Scala	Gray mold
9/12	Switch	Gray mold and anthracnose
11	Abound	Anthracnose
	Azaka	Anthracnose
	Cabrio	Anthracnose
17	Elevate	Gray mold

Botrytis control success is vastly improved if you know the resistance profile of your fields. Make sure you get the gray mold fungus tested. Download instructions at

http://www.clemson.edu/extension/horticulture/fr uit_vegetable/peach/diseases/br_strawberry.ht ml.

Spray less. Spraying less is the ultimate resistance management tool because we are selecting less. But that is only an option if we do not compromise disease control success. Research has shown that we are spraving way too many times and that often more than 50% of our applications are unnecessary. We are implementing an online tool, the Strawberrv Advisory System (SAS), in southern states that notifies growers when an application is truly necessary. Growers will need to be near a weather station that is hooked up through the internet to a weather database. Contact us for more information if you are interested. But if you do not have access to this system, table 2 shows the weather conditions that you may use to decide whether to spray or not. You might be surprised how many sprays you can save without compromising control especially in a reasonably dry year.

Table 2: Decision Support Chart for Gray Mold Management in Strawberry

Weather Conditions [*]		Peak					
LWD (h)	Temp (°C)	Bloom	Recommended Spray Strategy				
< 13	any	Yes or No	No spray				
> 14	17-25	No	Captan, Thiram				
		Yes	FRAC 17 (e.g. Elevate); FRAC 7 (e.g. Fontelis)				
		No	Captan or Thiram + FRAC 17 (e.g. Elevate) or FRAC 7 (e.g. Fontelis)				
> 18	17-25	Yes	FRAC 12 (e.g. Switch)				

*LWD = Leaf Wetness Duration in hours and Temp = temperature in Celsius during leaf wetness period

In conclusion, after more than a decade of applying multiple fungicides of multiple FRAC codes, resistance is now common in the gray mold pathogen *Botrytis cinerea*. But the resistance profile is different from location to location and depends on spray history, nursery source, and nearby crops hosting the pathogen. Knowing your resistance profile will enable you to prevent ineffective sprays and improve preharvest and postharvest disease control. We must make every effort to spray strategically and to limit the number of sprays and we must include nurseries in our efforts to control pests and diseases. Good luck!

USDA Provides Offers Crop Disaster Assistance For Fruit And Vegetable Growers

Reprinted from Growing Produce, 12/16/2014

USDA Secretary Tom Vilsack recently announced that greater protection is now available from the Noninsured Crop Disaster Assistance Program for crops that traditionally have been ineligible for federal crop insurance. The new options, created by the 2014 Farm Bill, provide greater coverage for losses when natural disasters affect specialty crops such as vegetables and fruits.

"These new protections will help ensure that farm families growing crops for food, fiber, or livestock consumption will be better able to withstand losses due to natural disasters," said Vilsack. "For years, commodity crop farmers have had the ability to purchase insurance to keep their crops protected, and it only makes sense that fruit and vegetable, and other specialty crop growers, should be able to purchase similar levels of protection. Ensuring these farmers can adequately protect themselves from factors beyond their control is also critical for consumers who enjoy these products and for communities whose economies depend on them."

Previously, the program offered coverage at 55% of the average market price for crop losses that exceed 50% of expected production. Producers can now choose higher levels of coverage, up to 65% of their expected production at 100% of the average market price.

The expanded protection will be especially helpful to beginning and traditionally underserved producers, as well as farmers with limited resources, who will receive fee waivers and premium reductions for expanded coverage. More crops are now eligible for the program, including expanded aquaculture production practices, and sweet and biomass sorghum. For the first time, a range of crops used to produce bioenergy will be eligible as well.

"If America is to remain food secure and continue exporting food to the world, we need to do everything we can to help new farmers get started and succeed in agriculture," Vilsack said. "This program will help new and socially disadvantaged farmers affordably manage risk, making farming a much more attractive business proposition."

To help producers learn more about the Noninsured Crop Disaster Assistance Program and how it can help them, USDA, in partnership with Michigan State University and the University of Illinois, created an online resource. The Web tool, allows producers to determine whether their crops are eligible for coverage. It also gives them an opportunity to explore a variety of options and levels to determine the best protection level for their operation. If the application deadline for an eligible crop has already passed, producers will have until Jan. 14, to choose expanded coverage through the Noninsured Crop Disaster Assistance Program. To learn more, visit the Farm Service Agency (FSA) website or contact your local FSA office. The Farm Service Agency (FSA), which administers the program, also wants to hear from producers and other interested stakeholders who may have suggestions or recommendations on the program. Written comments will be accepted until Feb. 13 and can be submitted through Regulations.gov.

Source: USDA news release

New Invasive Pest Found In Pennsylvania

Reprinted from Growing Produce, 11/04/2014



Photo credit: Pennsylvania Department of Agriculture

An invasive insect new to the U.S. that has the potential to damage grape, tree fruit and hardwood industries has been discovered in Berks County, PA, prompting the immediate quarantine of Pike and District townships.

The Spotted Lanternfly, an inch-long black, red and white spotted pest, is native to China, India, Japan and Vietnam. It's an invasive species in Korea, where it has attacked 25 plant species which also grow in Pennsylvania.

"Since this is new to the country we are taking every precaution possible," said Agriculture Secretary George Greig. "We need to do everything we can to stop the spread of the Spotted Lanternfly. Help us by looking for adult insects and their egg clusters on your trees, cars, outside furniture – any flat surface that the eggs may be attached to."

The Spotted Lanternfly, Lycorma delicatula, attacks grapes, apples, pines and stone fruits. It often attaches to the bark of Tree of Heaven – sometimes referred to as Paradise Tree – an invasive species similar to Sumac that can be found around parking lots or along tree lines.

Adults often cluster in groups and lay egg masses containing 30-50 eggs that adhere to flat surfaces including tree bark. Freshly laid egg masses have a grey waxy mud-like coating, while hatched eggs appear as brownish seedlike deposits in four to seven columns about an inch long. Trees attacked by the Spotted Lanternfly will show a grey or black trail of sap down the trunk.

The department is investigating the quarantined and surrounding areas to assess the spread and impact of the pest. Additional townships may be added to the quarantine.

"Berks County is the front line in the war against Spotted Lanternfly," said Greig. "We are taking every measure possible to learn more, educate the public and ourselves and eliminate this threat to agriculture.

For more information, including photos and video of the Spotted Lanternfly, the full quarantine order, a sample submission form and updates in the fight, visit the Pennsylvania Department of Agriculture's post on the Spotted Lanternfly.

Source: Pennsylvania State news release

China Could Be Big Market For Blueberries

Gary Pullano

Reprinted from Fruit Grower News, 1/02/2014



Speaking to a farm group in December, <u>Michigan Gov. Rick Snyder</u> said he learned from a recent trade mission to Asia that the Chinese people "love Michigan blueberries. That's an example of the opportunities we can build on."

"Overall, the opportunities are just fabulous in terms of selling more product," Snyder said. "China could buy every blueberry we own; it's really that balancing act."

Findings from ongoing research by <u>Michigan</u> <u>State University</u> (MSU) personnel, conducted with help from <u>Project GREEEN</u>, indicate Snyder's identification of a burgeoning market for U.S. blueberries in China is likely on target. The research project looked at "The Impacts of Expanding Chinese Production on Michigan's Blueberry Sector." It was funded with \$7,600 provided by Project GREEEN and another \$87,701 in leveraged support from other sources.

The conclusion is encouraging for blueberry growers and processors from throughout the United States who are interested in marketing their fruit in China.

"This research has summarized the results of several years of in-country research in China, focusing on the production and demand potential in China for blueberries," the Project GREEEN 2013 Legislative Report states. "In the short term, there seems to be a good opportunity for U.S. firms interested in exporting blueberry products to China; in the long term, Michigan and U.S. blueberry producers need to be aware of trends in prices and careful to respond accordingly."

The report indicated that while China's production capacity could one day be a major competitor on the world market, the bigger opportunity for U.S. and Michigan producers is Chinese demand for blueberry products. Between 2006 and 2011, exports of dried blueberries from the United States to China increased from zero to more than 393,000 pounds. In the same period, China imported over 550,000 pounds of frozen blueberries, though none in 2011. South Korea is showing even more growth in imports of U.S. blueberry products.

Mollie Woods, an MSU specialist in agricultural economics, said concerns about China's intentions regarding the ramp-up of blueberry production are somewhat overblown.

"We went into it worried about China as a competitive threat, and I don't downplay that because it can be, particularly in the east Asian markets, but it's also an opportunity there for our exports," Woods said.

While the project's final report has been out for awhile, project researcher Mark Longstroth, an MSU Extension educator who has made numerous trips to China to detect trends in that nation's fruit production efforts, is keeping a watchful eye, as apparently inflated market estimates continue to come from the Chinese agriculture industry.

"It's exceedingly hard," Longstroth said about getting a clear picture of China's blueberry production – including what comes out of the growers' own mouths. "Based on the numbers they gave me in 2008 and again in 2010, I don't think their numbers are believable."

Longstroth was told the Chinese planned to double or triple their acreage in blueberries in a

few short years, but their market vision was primarily to export the product and not take advantage of a growing market within their own country.

"They only seemed to see the city of Bejing as one market, and export as high value beyond that. They didn't think of their other large cities. They are fresh marketing into Beijing and using frozen or juice for export. I think it will change." He said there was a lot of emphasis being put on large subsidy investment for blueberry production in China. The payoff, however, doesn't seem as bountiful in light of the lack of fertile ground in some of the regions where blueberry plantings are taking place.

"Blueberries are site-sensitive," Longstroth stressed. "You really have to have acidic soils and maintain most soil all year round. They were planting blueberries on sites that don't have that. Some people are doing a very good job, especially small producers who have some real nice sites. The real big ones are putting a lot of money in, but they're not going to get the results.

"In the northern parts of China, I have my doubts. It gets so cold in the wintertime out of Siberia and down the seas. They literally have their blueberries die down to the ground. Riceland is being converted to blueberry. Everybody hears these tales of them planting thousands of acres. Everyone thinks they're just going to shift to blueberries, but it's not that easy. (Michigan's) biggest competition is in Georgia and Oregon."

"For some time I've said that, essentially – rather than being something to be afraid of – it's more of a market opportunity for us," Longstroth said of the Chinese market's potential for U.S. blueberries.

A growing market for fresh blueberries in China is more likely to draw increased interest from West Coast growers and those in Chile than those marketing Michigan berries, he said.

"We don't ship an awful lot to the Pacific Rim anyway," Longstroth said. "Most of our blueberries go to the east side of the market here."

Pricing of Chinese blueberries isn't a significant factor here, as the industry currently faces more troubling realities at home.

With the currently "saturated" market in the United States, Longstroth said, "there's a lot of downward pressure on the domestic industry. (The pricing) is pretty low. In China, when I talked with them about the last 20 years of prices received by Michigan growers, they couldn't believe how it got so low. In the past, if we have a large stock of frozen blueberries going into the season, the price is depressed for everybody and that was the case this year.

"We've got more price pressure from new plantings from us and Mexico than someone shipping across the Pacific. We're the biggest market and biggest producer – I just don't see (China) being a huge threat. The economics aren't there. They aren't as pricey as they used to be."

The MSU report stated that the commercial blueberry industry developed slowly in China. After 2006, however, blueberries became the fastest developing fruit industry in China due to investment from domestic and international companies.

China's blueberry production area increased from less than 100 acres in 2001 to 2,334 acres in 2007. The average annual increase was 70 percent for the years 2001 to 2005, and 161 percent from 2006 to 2010 (based on expected production area in 2010).

So far, more than 10 provinces have begun commercial blueberry production, ranging from northeast to southwest China. Total production increased from 3 tons to 390 tons from 2002 to 2007.

The report stressed that high-value products like dried blueberries – which fit well with the Chinese supply chain, which often lacks a cold-

chain component - should be emphasized. It stated that the Michigan blueberry industry could successfully target a dried blueberry export program to China and South Korea. "The elasticity of supply for blueberries in the U.S. and Canada is inelastic," the report concludes. "This means our growers in North America are slow to make planting decisions based on price. This is exacerbated by the long lag time present with a perennial fruit crop that requires four to five years to mature. There is a real danger of over-supplying the market when the signal is saturation. Current blueberry prices indicate strong demand, however the industry should be aware of the tendency and be as nimble as possible."

Blackberry and Raspberry Seasonal Checklist Winter 2014-15

Gina Fernandez, Small Fruit Specialist North Carolina State University

This checklist was originally developed for blackberry growers in North Carolina. Many of the items apply to raspberry production as well. You may have to adjust your work activities either earlier or later depending on your location. For more detailed information, check the Southern Region Integrated Bramble Management Guide and the Southeast Regional Bramble Production Guide at:

http://www.smallfruits.org/SmallFruitsRegGuide/ index.htm.

Check the items off as they get done. This list is very general, but should help get you to think about what types of activities occur at various times of the year. If you would like other items to be added to this list, send them to me and I will add them next time.

WINTER

Plant growth and development

- Plant is not visibly growing during the winter months although many blackberries will retain their leaves through the winter
- ✓ Some differentiation is occurring in the flower buds
- ✓ Low chilling cultivars can break bud in January after adequate winter chilling. You can monitor chilling hours accumulated in eight states in the eastern US by accessing this site: <u>http://www.nc-</u> <u>climate.ncsu.edu/cronos/blackberry/index</u> .php
- $\sqrt{}$ Developmental stages for IPM guide:
 - 1. Dormant
 - 2. Delayed dormant (swollen bud) to green tip

Pruning and trellising

- Pruning should occur in late winter. However, in some areas winter ice storms can do tremendous damage to plants and trellis systems. If you produce blackberries in one of these areas, pruning can take place early winter to help avoid severe damage.
- ✓ Make trellis repairs after plants have defoliated but before pruning and training.

Erect types

- $\sqrt{}$ Prune out the spent floricanes
- \checkmark Tie canes to wires in a fan shape
- √ Cut lateral branches back to 8-12"
- ✓ Thin canes to 6-8 canes/ hill (4 ft spacing)

Trailing types

- $\sqrt{}$ Prune out spent floricanes
- \checkmark Tie or weave canes to wire so that they do not overlap
- $\sqrt{}$ Prune side laterals to 12-18"

 \checkmark Thin canes to 6-8 hill (6-8ft spacing) Primocane fruiting raspberries and blackberries

✓ Prune (mow) primocane fruiting types to ground level

Weed control

Check the Southern Regional Bramble integrated Management Guide for recommendations. www.smallfruits.org

✓ Many summer weed problems can be best managed in the fall and winter using preemergent herbicides. Determine what weeds have been or could be a problem in your area. Check with local extension agent for cultural or chemical means to control these weeds.

Insect and disease scouting

Check the Southern Regional Bramble integrated Management Guide for recommendations. www.smallfruits.org

- \checkmark Scout fields for insect and disease damage and remove those canes
- Remove wild blackberries and raspberries by the roots if they are within 600 ft of your planting during the winter

Planting

- $\sqrt{}$ Take soil tests to determine fertility needs for spring plantings.
- There are some new raspberry and blackberry cultivars available each year.
 If you have not tried them or it is not know how they will do in your region, it is best to order a small quantity to see how well they will perform in your area
- ✓ For larger growers, prepare list of cultivars for 2015 plantings and order now. Smaller quantities of plants can be order in early 2014 for spring 2014 planting
- ✓ A commercial small fruit nursery list at http://www.fruit.cornell.edu/berry/nurseries/

Water management

- ✓ Make repairs to irrigation system (check pumps, lines, etc)
- ✓ Plants generally do not need supplemental water in winter

Marketing and miscellaneous

 $\sqrt{}$ Order containers for next season

- ✓ Make contacts for selling fruit next season
- $\sqrt{}$ Attend grower meetings:
 - The 2015 North American Raspberry & Blackberry Conference will be held in Fayetteville, Arkansas, on February 24-27, 2015. For more information and an sneak peek at the program: http://www.raspberryblackberry.co

m/local.cfm?doc=webdocs/2015C onference Overview.htm

- Southeast Regional Conference and Tradeshow, with sessions on blackberry
- January 8-9, 2015, at the Savannah International Trade and Convention Center <u>http://www.seregionalconference.c</u> <u>om/educational-sessions/</u>
- The North Carolina Commercial Blackberry and Raspberry Growers Association
 - Date not set at printing. For more information contact <u>Daniel_Shires@ncsu.edu</u>

For more information on growing caneberries see: http://www.smallfruits.org/ http://rubus.ces.ncsu.edu/

Strawberry Seasonal Checklist January- February Growers Checklist

Gina Fernandez, Small Fruit Specialist North Carolina State University

Post-Planting Maintenance

- Maintain fence perimeter to eliminate deer passage. A double row of electrified fence (tape or wire type) has been effective when installed early in the season. Consider attaching foil, paper plates or grocery store plastic bags at regular intervals to increase the visibility of the fence.
- Check for dead plants and send suspicious-looking plants to the Disease & Insect Clinic for positive ID; However, plant growth during the winter months is very limited and disease development is also severely reduced which makes scouting difficult. Weekly scouting in uncovered fields (no row covers) is still advisable to hedge off any biological, environmental or mechanical issues in the planting.
- If strawberry plants formed runners in the fall after planting, cut these runners off – hand scissors or pruners do an excellent job. Runner removal may be combined with hand-weeding operations.
- Check for vetch in holes and weed out, the winter temperatures will not kill them

Preparation for frost protection

- Purchase your digital thermometer before you need it! Calibrate all thermometers to read a true 32°F in an ice bath.
- Monitor weather forecasts closely consider a subscription to a custom

weather report/service. Even with custom services, your local conditions can be quite different. When frost is likely, plan on tracking hourly temperatures in the field so you can respond to your actual conditions.

Check your irrigation system and consider doing a "wet run" prior to an actual frost protection event to ensure proper pump and nozzle operation and coverage.

Preparation for spring fertility

- Check the drip irrigation system (pumps, filters, pies/lay flat and drip tape connectors) by performing a "wet run" to check for adequate flow and pressure and repair any leaks or clean filters as needed.
- Typical sources of nitrogen range from UAN (Urea ammonium nitrate), calcium nitrate, potassium nitrate and various complete fertilizer blends
- Tissue sampling is the best way to determine the appropriate rates for macro (N,P and K) and micro (Boron and possibly others depending on soil type and chemistry) nutrients.
 <u>http://www.ncagr.gov/agronomi/pdffiles/s</u> <u>berrypta.pdf.</u> Prepare for leaf tissue analysis in late February in eastern NC.

Preparing for pest and pathogen management

- Check your chemical inventories, order any necessary chemicals and fertilizers
- De-winterize your sprayer, inspect the entire system for leaks, clean primary filters and screens, check nozzles for proper flow rates (replace when old tips

exceed specified flow rate by 10%) and calibrate the sprayer for the appropriate rate of water per acre.

http://www.nccropprotection.org/FactShe ets/Calibrating_boom_sprayer.pdf

 Continue to scout your planting for pest and pathogen pressure as the season continues; examine plants for spider mite damage as this can be mistaken for winter damage

Preparation for harvest and marketing

- Order picking containers, if not already done
- Prepare signs for stands and roadside directions
- Think about marketing and what you can do to improve sales
- □ If you plan to wholesale your fruit, line up buyers now
- □ Order advertising

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