

The Blueberry News

Official Newsletter of the Florida Blueberry Growers' Association
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A MESSAGE FROM THE PRESIDENT

Summer is upon us and another harvest is over. I hope your season went well. From everything I am hearing Florida as a whole had a breakout year. According to the Florida Dept. Ag. and Consumer Services, Florida shipped over 2 million pounds this past harvest season. If this is an indicator of larger volumes in the future, it will behoove us as growers to do everything we can to produce the best quality product at the lowest production costs. I encourage you to consider these things when deciding what varieties to replant and how you caretake your fields.

Your Board of Directors will be meeting sometime in September to discuss our Fall meeting; if you have any topics you feel would be valuable for the Association to discuss or have a speaker give a talk, contact one of your directors and we will work towards getting it on the program

A friend gave me this description of farmers and farming as a way of life. In farming you only have a limited number of attempts at getting "it right". For example, if you grow blueberries for thirty years you only get "30" times to do it right. Whereas in other jobs you may get "30" times a day to get "it" right. Here s to working hard and working smart so that we get "it" right more often than we get "it" wrong.

The program for our fall meeting will be in the next issue of Blueberry News. I look forward to seeing you at that meeting.

Jerry Mixon, Jr.
FBGA President

FREEZE PROTECTING FLORIDA BLUEBERRIES - Part 1.

The following article was taken from a presentation made by Paul Lyrene at this year s Florida State Horticultural Society meetings in Lake Buena Vista. It is rather lengthy but full of useful information. Therefore, it will be presented in two parts. Part 1 is presented here and part 2 will be presented in the Fall issue of *Blueberry News*.

Southern highbush blueberries are grown commercially in Florida from La Belle north to the Georgia line, with most of the production in the area from Plant City to Jacksonville. There is also increasing acreage of southern highbush blueberry in southeastern Georgia around Homerville. The goal of Florida blueberry growers is to harvest blueberries for the fresh market from 1 April to 15 May. During this period, Florida weather is favorable for producing and harvesting high-quality fruit. Cool nights and warm, sunny days increase berry firmness and Brix. Humidity is low, and any dew on the berries dries quickly after sunrise. Extended rains that delay harvest and split the berries are rare. Temperatures are comfortable for workers hand-harvesting the fruit. This season also comes between the end of blueberry harvest in Chile (the major exporter of fresh blueberries to the U.S. from Nov. to Mar.) and the beginning of harvest in the first major production area to the north (southeastern North Carolina about 20 May).

The blueberry varieties grown in Florida require 50 to 70 days to ripen after the flowers open. The length of this period depends on the variety, and is shortest when the plants are vigorous, heavily leafed, and are carrying a light crop, and when temperatures are above normal during the period between flowering and fruit ripening. Extended cool periods after flowering greatly delay maturation.

Blueberries that ripen in early April come from flowers that are pollinated in early February. Blueberry flowers become vulnerable to hard freezes several

weeks before they are pollinated and can be killed by hard freezes in late January. Thus, blueberry flowers in Florida that are not protected from cold are frequently killed by freezes, and yields are often reduced. Overhead irrigation is currently the only method of freeze protection widely used in Florida by commercial blueberry growers. The ice load that accumulates during freeze protection is less damaging to blueberry plants than to citrus. Blueberry plants are more supple than citrus; they also have fewer leaves during the season when freeze protection is needed and accumulate a smaller ice load.

Protecting Blueberries from Freezes with Water in Florida -

It might be expected that protecting the blueberry crop from freezes with overhead irrigation would be easier and more effective in Florida than in North Carolina and New Jersey. Such is not the case. The reason is that Florida growers must protect their crops during February and March, whereas in North Carolina almost all freeze damage to blueberries occurs after April 1. By April 1, most killing freezes in the southeastern U.S. occur on nights with little wind and with dew points only slightly below freezing. By contrast, Florida growers trying to protect blueberry flowers during February and early March may face temperatures below 28 °F, winds gusting over 10 mph, and dew-point temperatures substantially below air temperatures. In this situation, unless a very large volume of water is continuously applied, heat loss from evaporation will exceed heat gain from freezing water, and the overall effect of irrigation will be to lower the temperature in the field rather than to raise it. Insufficient irrigation on windy nights with low dew points has sometimes resulted in complete crop loss and severe plant damage, including cane death and substantial plant mortality. Not only must the Florida blueberry grower install a costly irrigation system, but he or she must also learn when to stand by and receive damage without turning on the system.

Temperatures in a Blueberry Field at Night -

If the wind blows continuously all night, the temperature of the air 1 foot above the ground will be the same as at 10 feet. This will be the same as the thermometer temperature measured 5 feet above the ground in a standard instrument shelter, which will be the same as the temperature indicated by an unsheltered thermometer hanging from a leafless branch 5 feet above the ground, which will be the same temperature as the petals and ovaries of the flowers and the surface of the berries. However, if the wind dies, even for one minute, no two of these temperatures will remain equal. The temperatures that matter, those of the pistils and petals of the flowers and the temperature of the young berries, will not be accurately indicated by either the sheltered or unsheltered thermometer. With clear sky, no wind, and a low dew point, each item in the blueberry field will attain its own distinct temperature, depending on its location and on its ability to lose heat by radiation. Thus, the roof of a car parked in the field may become frosty (surface temperature below 32 °F) before the sheltered thermometer (air temperature at 5 feet) reaches 40 °F.

It is often given as a general guide that open flowers of blueberry and peach can survive temperatures down to about 28 °F but not lower. However, we have seen fully open blueberry flowers undamaged when the temperature in a standard instrument shelter was below 26 °F for more than one hour on a night when a strong wind blew continuously with no periods of calm. We have also seen blueberry flowers at the same stage of development destroyed by a freeze on a calm night with a low dew point when the same sheltered thermometer did not fall below 30 °F. The simplest explanation for these observations is that open blueberry flowers with corollas still attached can survive flower temperatures as low as 26 °F, but flower temperature, like the temperature of a car top, can fall below 26 °F when the shelter temperature remains above 30 °F if there is no wind and the dew point is very low.

Dew/frost Formation and its Effect on Temperatures in the Field -

The following discussion refers to air temperatures 2 to 7 feet above the ground, where most blueberry flowers and fruit are located. The discussion assumes low-lying land with little local relief, which is typical of blueberry farms in Florida.

If there is little or no wind, most temperature fall at night occurs because objects in the field are losing heat by radiation faster than they are absorbing heat from other radiating sources. The net rate of heat loss for any particular object depends on its physical properties, including density and molecular composition. Dry air is a very poor radiator, and loses heat only slowly at night. Almost every object in the field and on the ground loses heat faster than the air, and, in the absence of wind, objects in the field, including flowers and fruit, quickly become colder than the air that surrounds them. How much colder? The answer depends on the size, texture, and radiating ability of the object and on the wind speed and dew point temperature of the surrounding air.

Because many objects in the field are colder than the air at night, dew or frost form as the temperatures of the objects fall below the dew point temperature of the air. Formation of dew or frost liberates latent heat that was present in the water vapor, and greatly slows the rate of temperature fall in the field. This is why temperatures on clear nights with light winds normally fall rapidly until dew or frost begins to form, and thereafter fall much more slowly, normally only about 1 °F per hour during the winter, and even less during the summer, when, because the air is warmer, a greater amount of dew condenses per 1 degree temperature drop. Unfortunately, in the absence of enough wind to mix the layers of air, formation of dew or frost quickly dehydrates the air in the field, preventing fog formation. If neither dew nor frost formed, the air near the ground would fall to its dew point and fog would form. Formation of a fog layer would protect the crop from further temperature falls. Normally, dew or frost are forming on many objects in the field by the time the relative humidity of the surrounding air has risen to about 95%. At temperatures near freezing, this occurs when the air temperature has fallen to about 1 °F above its dew point. Condensation of dew or frost lowers the dew point of the air, and allows air temperature to continue to fall below the temperature that was its dew point earlier in the night. The decline in dew point in a blueberry field as a result of dew or frost formation can be more than 4 °F.

Wet Ground and Weed-Free Fields to Reduce the Fall in Dew Point Temperature -

The ground in the Florida peninsula, even during severe freezes, is seldom snow-covered or frozen. If the ground is wet at the surface and is wet to field capacity to a depth of 2 feet, it constitutes a large reservoir of heat and moisture that can help replenish the moisture lost from the air as frost forms. One cubic centimeter of moist soil can store as much heat (measured in cal/cm³/°C) as 1300 cubic centimeters of air. If the soil surface is moist, packed, and bare of vegetation, evaporation of moisture from the soil surface and the subsequent condensation of water vapor as frost will act as a pump that transfers heat from the soil to the plant surfaces and surrounding air. Evaporation from very moist soil may even raise the dew point of the surface air

trapped beneath the inversion on a calm night, thus limiting the temperature fall in this inversion layer.

The effect of surface water on minimum temperatures was noted by a blueberry grower in Clinch County, near the Okefenokee Swamp, in southeast Georgia during the winter of 1999-2000 (Jerry Vanerwegen, personal communication). Due to a prolonged drought, most of the cypress ponds, which normally cover a large fraction of the county, were dry, and throughout the winter, minimum temperatures during radiation freezes frequently fell substantially below forecast values, often by 5 °F or more, even though the same forecast service had been highly reliable in years when the cypress ponds were at their normal levels.

Part 2 of **Freeze Protecting Florida Blueberries** will be printed in the Fall issue of *Blueberry News*.

A SURVEY OF BLUEBERRY ACREAGE IN FLORIDA

The following information was taken from a paper presented by Jeff Williamson at the recent meeting of the Florida State Horticultural Society in Lake Buena Vista.

The last official survey of blueberry acreage in Florida was conducted in 1989 by Crocker and Willis. They reported a total acreage of approximately 2100. This represented an increase of almost 100 % during the 5-year period between 1989 and 1984 when an earlier survey had been conducted by Crocker and Lyrene. More recently, significant changes in Florida's blueberry industry have occurred, including establishment of many new plantings of southern highbush (SHB) cultivars and decreased rabbiteye (RE) production. The purpose of this survey is to determine the current acreage of commercial blueberries in Florida by, type (SHB vs RE), age, and location in the state.

During the spring of 2000, a survey questionnaire was mailed to all county extension offices in Florida counties where blueberries were grown commercially. County extension faculty in each county were asked to provide information on the total number of commercial SHB and RE blueberry acres in their counties, the number of acres that were less than three years old, the number of blueberry farms, and whether the majority of fruit from each farm was handled through commercial shipping markets, or sold locally (u-pick, roadside, etc.). Information was obtained by phone for counties that did not respond to the original mailing. All counties where commercial blueberries are grown were represented. For the purposes of reporting data, Florida was divided into four production regions: 1) northwest (counties in the panhandle west of the Apalachicola River; 2) north (counties east of the Apalachicola River and north of Citrus, Sumter, Lake and Volusia counties); 3) central (counties south of the northern region and north of Manatee, Hardee, Okeechobee and Indian River counties); and 4) south (counties south of the central region).

Results of the Survey

[Table 1](#) shows RE and SHB blueberry acreage by region. The northern region contained the largest total acreage of blueberries and the largest acreage of each type. The central region ranked second in total acreage and second in SHB acreage. Total blueberry acreage decreased for the western and northern regions since 1989. This is primarily because many rabbiteye farms in these regions were abandoned during the 1990's. Only a few acres of RE blueberries were grown in the central or southern regions of Florida. The increase in total blueberry acreage in these two regions since 1989 reflects a growing interest in SHB blueberries, which are better suited for the low-chill climates of central and south Florida. The central region of Florida reported a 128% increase in SHB blueberry acreage since 1989. Even in the northern region, where total blueberry acreage decreased, SHB increased by about 22% since the previous survey ([Table 2](#)). Overall, statewide blueberry acreage decreased from about 2100 acres in 1989 to about 1460 acres in 2000. However, statewide SHB blueberry acreage increased by about 23% during the same period ([Table 2](#)). The leading counties for blueberry acreage in 2000 were Alachua (580 acres), Highlands (116 acres), Polk (87 acres), Hillsborough (80 acres), and Lake (63 acres). Alachua (northern region) and Highlands (southern region) counties have had blueberry production for many years, but Polk, Hillsborough and Lake counties (all in the central region) have only recently become established as major blueberry-growing counties. The growing importance of these and surrounding counties in central Florida is reflected by the fact that SHB acreage has increased by 128 % in the central region of Florida since 1989.

[Table 3](#) shows total SHB blueberry acreage and the SHB acreage that is less than three years old. Generally, in all but the western region, about one-third of all SHB acreage was less than three years old. Because SHB blueberry plants do not begin to produce full crops until their fourth or fifth year in the field, these data suggest that considerable increases in berry production can be expected in the future from current plantings. It is noteworthy that blueberry exports from Florida have averaged about 1.5 million pounds per season during the last five years (Division of Marketing and Development, Florida Dept. Ag. Consumer Serv.). However, more than 2 million pounds of fresh berries were shipped from Florida during the 2000 harvest season. Some of this increase in fresh berry shipments can be attributed to excellent weather, improved cultivars, and better management practices; however, it also appears to be partially due to increasing SHB acreage in Florida.

Conclusion

Since 1989, Florida's blueberry industry has undergone many changes, the most significant of which was a shift away from rabbiteye (RE) production toward the earlier-ripening southern highbush (SHB) cultivars. In 1989, RE cultivars comprised approximately 68 % of the total acreage. Today SHB cultivars are the most widely planted blueberries in Florida. Several large RE plantings which were present during the late 1980's and early 1990's have either been abandoned, or have been replanted with SHB cultivars. Central Florida experienced the greatest increase in total commercial blueberry acreage during the last decade. The overall decline in total blueberry acreage in Florida since 1989 is perhaps a misleading indicator of the current growth phase of the industry. More revealing indicators of the overall growth and health of Florida's commercial blueberry industry are represented by the net increase in SHB acreage aimed at the lucrative early-season market, the relatively high percentage of young blueberry acreage, and the increase in exported berries from Florida during the market window between April 1 and May 20. Although there is high interest in producing crops for this early market window, local (u-pick and roadside) markets appear to be underutilized, especially in areas near major population centers.

Table 1. Florida blueberry acreage by region.

Cultivar	Production region				Total
	West	North	Central	South	
Southern highbush	5.5 (-)	368 (+)	282 (+)	169 (+)	824.5 (+)
Rabbiteye	109 (-)	501 (-)	22 (-)	5 (+)	637 (-)
Total	114.5 (-)	869 (-)	304 (+)	174 (+)	1461 (-)

^z +, - indicates an increase or decrease in acreage since 1989.

Table 2. Changes in acreage of blueberry by type between 1989 and 2000.

Region	Southern highbush acreage			Rabbiteye acreage		
	year		% change	year		% change
	1989	2000		1989	2000	
West	173.5	5.5	-96	288	109	-62
North	301	368	+22	1061	501	-53
Central	198	450	+128	85	27	-69
Total	672	824	+23	1434	636	-56

Table 3. Total southern highbush blueberry acreage and acreage less than three years old by region in Florida.

Region	Southern highbush blueberry acreage		Percent of acreage less than 3 years old
	total	< 3 years old	
West	5.5	0	0
North	368	132	36
Central	282	105	37
South	169	46	27
Total	824.5	283	34

2000 CROP REPORT

According to the Florida Dept. of Ag. and Consumer Services, Division of Marketing and Development, Florida's export blueberry crop was the largest ever on record with about 2,077,000 lbs. of fresh berries shipped out of state between 31 Mar. and 30 May. Prices were high (\$40+ per 125 g flat) early in the season, leveling off in the mid to upper \$20's during the latter half of April. By early May prices were in the mid to lower \$20's and steadily decreased to the \$14 - \$16 range by May 19. Prices further declined and remained in the low teens for the remainder of our season.

BLUEBERRY PRODUCTS AND SERVICES

Blueberry Hill Nursery. Come by and see our plants, potted rabbiteye and highbush. We're in Salt Springs. Call (352)685-2769. Lic. No. 47217069.

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We welcome advertising from blueberry nurseries and suppliers. The cost is 30 cents per word per issue of the newsletter in which your message appears. Send your blueberry-related message and a check payable to FLORIDA BLUEBERRY GROWERS' ASSOCIATION to our address given below under membership information.

MEMBERSHIP INFORMATION

To join or renew your membership to the Florida Blueberry Growers Association, mail a check payable to **FLORIDA BLUEBERRY GROWERS ASSOCIATION** to our address:

Florida Blueberry Growers Association
P.O. Box 141733
Gainesville, FL 32614

The Association annual dues depend on which membership category you fit best.

1. Regular Florida Member - \$10.00 per acre of blueberries, except a minimum of \$50.00 and a maximum of \$200.00.
2. Out-of-state member - \$50.00
3. Associate member - \$100.00 (Equipment and chemical companies, etc.)
4. Educational and Research - \$10.00 (University and USDA personnel who do not grow blueberries commercially)