

Tips From the Sweetpotato Experts: Sweetpotato Production in North Carolina

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The North Carolina sweetpotato industry is comprised of approximately 400 family farms plus a number of packers and affiliated businesses that produced nearly one billion pounds of raw sweetpotatoes during 2011. The number of growers producing sweetpotatoes in North Carolina has increased due to growing consumer demand for sweetpotatoes. The farm gate value of sweetpotatoes was about \$226 million in 2011, and has increased over \$100 million since 2002. Increased consumption of sweetpotatoes has resulted in the increased value and sales of sweetpotatoes in the United States. Per capita consumption increased substantially from 3.7 lbs in 2002 to 6.3 lbs in 2010. One of the key drivers for the increased consumption of sweetpotatoes are its health benefits. Another important factor is the increasing sales of value added sweetpotato products, especially frozen (i.e, fries). North Carolina is the number one sweetpotato producing state in the United States and accounts for approximately 45% of the crop production and acreage. It is in the best interest for North Carolina sweetpotato growers to optimize their growing practices that results in a high yielding, quality crop that is profitable. North Carolina State University has a large research and extension team of faculty in multiple disciplines; sweetpotato breeding and genetics, micropropagation/plant propagation program, cultural management, insect management, disease management, weed management, biological and agricultural engineering (storage and curing structures, machinery), postharvest, and economic or budget analysis. The main component of my program involves production, although I will touch on many of the areas mentioned as our sweetpotato team has very integrated programs.

There are several considerations when producing a crop of sweetpotatoes. I will comment and discuss the following topics; use of high quality “seed”, plant production, variety selection, planting, fertilizer management, soil moisture, pest management, and harvest and storage considerations. I will spend a little more of my time describing greenhouse plant production since it was indicated to me that this was of particular interest to growers in the northeastern part of the United States. All the subject areas mentioned previously are important and I will try to make some key points for each.

Starting with high quality seed for any crop is critical and sweetpotatoes are no exception. Sweetpotatoes are vegetatively propagated, thus there can be a carry over of pest problems from one season to the next. In particular, sweetpotatoes will harbor viruses which can affect both yield and quality. To help overcome this problem, there are about 10 certified “seed” growers in North Carolina who provide the growers in North Carolina, out of state growers and even international growers with certified plants or “seed” that are of the highest quality. Certified sweetpotato seed growers will maintain high quality seed by annually purchasing virus-tested plants from the Micropropagation Unit and Repository at North Carolina State University. The

plants that the certified sweetpotato seed producers purchase from North Carolina State University are elite plants that are maintained in a vegetative state in tissue culture and screened cages (this minimizes the chance for any mutation and the deterioration or “running out” of the variety over time). Growers need to avoid growing sweetpotatoes from the same stock for more than 3 growing seasons in order to maintain high yield and quality in their production. Beauregard variety is extremely sensitive to the feathery mottle virus and shapes can become distorted and appearance unsightly due to bands forming on the roots if conditions are favorable in a given year. This symptom and disease is known as russet crack.

Variety selection is very important, and location where the sweetpotato is to be produced is critical. Sweetpotato is a tropical plant; however, it is often produced in temperate climates. The sweetpotato thrives when grown in high temperature conditions. The optimal temperature for growing sweetpotatoes is between 85 to 90 F. Because at least 90 favorable growing days are needed to produce a reasonable crop, although 105 days is more typical, the window for planting a crop in cooler, northern climates is narrow. There is more flexibility when planting sweetpotatoes in the southern United States due to a longer, warmer growing season than in the northern United States. The Beauregard variety tends to size as quickly as any sweetpotato variety currently available. However, ‘Covington’ sweetpotato is grown on 80 to 85% of the acreage in North Carolina. ‘Covington’ sweetpotato generally do not yield more than ‘Beauregard’ sweetpotato. The reason North Carolina sweetpotato growers choose to produce ‘Covington’ is because it packs out much higher than ‘Beauregard’ sweetpotatoes.

Plant production in North Carolina is typically done with plant beds that are planted in mid March to early April. The seed beds are covered with plastic and a drip line or two are placed in the bed for watering and fertilization purposes. As plants emerge from the soil and day-time temperatures increase, the plastic cover over the plants is pulled back or removed. It can turn too hot under the beds (over 125 F) if the plastic is not removed as temperatures increase later in the spring. This can cause the seed to rot in the bed. The majority of the plants for North Carolina sweetpotato growers are obtained from these outdoor beds beginning in mid May until planting is completed in late June or early July.

Some plant production is done in greenhouses rather than in outdoor beds in North Carolina. By growing in protected greenhouse conditions in which temperatures can be regulated, sweetpotatoes can be planted earlier in the season than if produced in outdoor beds. In North Carolina, approximately 2 to 4 weeks are usually gained by growing greenhouse sweetpotato plants. This usually results in earlier harvest, and can result in higher yields, especially if grown in climates that are cooler than North Carolina. Plants can also be managed so they are uniform in size. Typically, about 16,000 plants are planted per acre.

For production in the greenhouse, a plastic layer is placed on the ground and holes are punched to allow for drainage. Soil mix is usually composed of 20% sand, 20% peat, 20% lime and perlite, and 40% aged bark, which is screened to be no more than ¾ inch in size. One cubic yard will cover approximately 80 ft² 4 inches deep. ”Seed” potatoes should be placed on the soil mix next to each other so they are almost touching. Approximately 25 bushels of seed potatoes are needed to produce one acre of sweetpotatoes as one bushel will yield between 600 to 1000 plants per bushel. The sweetpotato seed should be covered with no more than 1 inch of soil.

Appropriate fertilizer needs to be added and irrigation applied daily or every other day, depending soil type, weather conditions, and stage of plant growth. Plants will need to be mowed several times to obtain more uniform sized plants and this must be done a couple of times. Chemical control recommendations must be followed according the label. Once plant harvest(s) is/are complete, the roots and soil should be removed from the greenhouse. The greenhouse should be closed off and disinfested using solar radiation.

It is important to use high quality plants that are of good size (8 to 12 inches from cut point to growing point. Smaller plants may have reduced yields or they may not survive if planted under stressful growing conditions. Additionally, at least two nodes of the plant should be covered by soil to promote survival and yields.

Fertilizer program can vary due to variety. For example, Beauregard variety is an excellent nitrogen scavenger. About 50 pounds of nitrogen per acre for the season should be plenty. It is also advantageous to apply the nitrogen one time at lay by as this has been shown to increase yields in some cases. For 'Covington', a split application of nitrogen is recommended, one about 7 to 10 days after planting, the second application at layby. Total nitrogen for a crop of 'Covington' sweetpotatoes is 90 to 120 pounds per acre for the season. About 50 to 80 pounds per acre phosphate and 150 to 200 pounds potash is usually applied for producing a crop of sweetpotatoes.

Soil moisture at planting at levels that are not too wet or too dry is very important to achieve a good set of storage roots. The number of storage roots a plant produces is often determined within the first two to three weeks after planting.

The main weed pests in North Carolina are Palmer amaranth and nutsedge. If these and other weeds are not controlled, yields can be substantially reduced. Valor, Command and S-metalochlor are commonly used weed control compounds utilized by North Carolina growers for weed control. The most destructive insects in commercial North Carolina sweetpotato fields are wireworms and flea beetles. Grubs are more problematic and can be extremely damaging to sweetpotato crop if present in the field. Lorsban and bifenthrin are the most common chemistries used to control these soil borne insects.

Sweetpotatoes are primarily hand harvested in North Carolina. Because the sweetpotato is sensitive to skinning, the root needs to be handled with care to minimize damage. In order to heal damage on the root caused at harvest, sweetpotatoes are placed in curing rooms for about 5 to 7 days at 85 F and 90% relative humidity. After curing, sweetpotatoes are stored until ready for sale in rooms maintained at 60 F and 90% relative humidity.