Assessing sweet potato varieties for organic production of food and biofuel in Kentucky

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Abstract
Kentucky State University’s College of Agriculture, Food Science and Sustainable Systems is dedicated to assisting small, limited-resource, and minority farmers. Organic sweet potato production is being explored as a high-value, low-input enterprise for Kentucky farmers selling into food markets, with culls used for on-farm production of ethanol fuel. Sweet potatoes suffer little pest pressure in Kentucky, have a low nitrogen requirement, and are drought tolerant. They produce up to three times more carbohydrate per acre than corn, the current dominant ethanol feedstock. Trials on organic land in 2011 and 2012 compared yield and quality characteristics of two experimental sweet potato varieties developed for ethanol feedstock production (CX-1 and 7-24); and two popular food varieties (Beauregard and Hernandez). An experimental food variety bred for high anthocyanin content (Stokes Purple) was also included in the trial in 2012. Hernandez and Stokes Purple produced the lowest yield, with 4 and 5.5 tons per acre, respectively. The biofuel variety CX-1 gave the highest yield, with just under 10 tons per acre in both years. The biofuel varieties averaged 20-25% dry matter, while the food varieties averaged 15-23%. The new biofuel varieties show promise for increasing both food and biofuel feedstock yields from low-input farms.

Introduction
Sweet potato
• Drought tolerant
• Low nitrogen requirements
• Grows well in KY heat and humidity
• High carbohydrates/acre
• Long storage life

Varieties studied
Beauregard
CX-1
7-24
Hernandez
Stokes Purple

Factors recorded for each variety
• Yields
• Number of tubers per acre
• Dry Matter Content
• Rainfall per season

Materials and Methods
In 2011, four varieties of sweet potatoes were grown and in 2012 five varieties were grown on certified organic land.

Results and Conclusions

Bars labeled with the same letter are not significantly different (t-test, P<0.05)

Conclusion
CX-1 appears to show greater potential for biofuel production in Kentucky than other sweet potato varieties tested. Taste panels and nutritional analyses are needed to determine its suitability for food production.