

utilize sucrose and fructose. However, this is unlikely and we may be observing post-harvest changes in the sugar profile (one sample that had been stored frozen for four months showed a significant increase in sucrose concentration with a concomitant reduction of fructose and glucose). Most interesting was the occurrence of an unidentified peak around 3.8 minutes, found in all fermented samples.

*Specified Source(s) of Funding:* USDA

9:00–9:15 am

## Evaluation of Several Horticultural Plants as Biodiesel Crops

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Biodiesel is a non-petroleum-based fuel consisting of short chain alkyl (generally methyl or ethyl) esters, made by transesterification of a vegetable oil or an animal fat which can either be used alone, or blended with petroleum diesel in conventional diesel-engine vehicles. Biodiesel has better lubricating properties and generally higher cetane values than petrodiesel. Biodiesel can be produced from any triglyceride, and the predominant feedstock used in the United States is soybean oil, although other vegetable oils, such as corn, mustards, sunflower and peanut can be used. We are exploring several horticultural crops whose seeds are rich in oil and have potential as biodiesel sources, including coriander (*Coriandrum sativum* L.), cress (*Lepidium sativum* L.), meadowfoam (*Limnanthes alba* Benth.) and flower-of-an-hour (*Hibiscus trionum* L.). Compared to soybean oil, all of the species had higher unsaturated fatty acid levels, with meadowfoam having over 97 % unsaturates. Flower-of-an-hour oil contained the highest levels of polyunsaturates (which are oxidatively unstable), with coriander having the lowest levels. Biodiesel was prepared from all four species by reacting the triglycerides with sodium methoxide. The low temperature fluidity varied among the biodiesels, with coriander biodiesel exhibiting the most favorable cold flow properties. All four biodiesels had excellent lubricity values compared to petrodiesel, with cress being the best. Meadowfoam biodiesel was the most oxidatively stable, with coriander biodiesel also having higher oxidative stability than soy biodiesel. Both flower-of-an-hour and cress biodiesels were significantly less oxidatively stable than soy biodiesel. Our results indicate coriander and possibly meadowfoam show excellent potential as biodiesel crops.

*Specified Source(s) of Funding:* USDA

9:15–9:30 am

## Potential Biodiesel Plant Resources from China

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Compared with petroleum diesel, biodiesel has lots of advantages, such as biodiesel is a renewable resource. Exploration of plant-based

fuels has gained a lot of popularity in recent years and plant oils and fats as fuels have a bright future. This study had analyzed 135 angiosperm plants and 61 of them had great potential for biodiesel. Fatty acid components (especially C16-18 content), saponification number (SN), iodine value (IV), and cetane number (CN) had been examined to evaluate their potential for biodiesel, actually their fatty acid methyl esters, based on the EN and ASTM biodiesel standard. *Cornus controversa* (C16-18 content of 99.9%, SN = 204.79 mg/g, IV = 82.91 mg/100g, CN = 51.81), *Elaeocarpus hainanensis* (95.3%, 199.25, 80.30, 53.22), *Garcinia multiflora* (97.9%, 200.10, 72.78, 55.02), *Jatropha curcus* (99.7%, 203.70, 82.50, 52.06), *Lindera latifolia* (70%, 228.38, 63.02, 54.13), *Meliiodendron xylocarpum* (98.7%, 201.62, 72.03, 55.00), *Michella hedyosperma* (84.6%, 174.57, 86.06, 58.20), *Prunus undulate* (98.1%, 202.24, 84.53, 51.73), *Tutcheria championii* (100%, 202.59, 82.65, 52.17) and other 37 trees were recommended as potential biodiesel plants. *Euonymus alatus* (97%, 205.27, 85.65, 51.05), *Maytenus austroyunnanensis* (79.8%, 165.77, 57.77, 64.49) and other 4 shrubs should be included for biodiesel studies. *Akebia trifoliata* (98.4%, 201.72, 70.16, 55.47), *Hodgsonia macrocarpa* (100%, 206.02, 84.60, 51.22), *Iodes vitiginea* (100%, 217.92, 65.89, 54.54), and other 4 lianas should be considered as potential biodiesel plants. Two annuals, *Cyperus esculentus* (100%, 202.06, 89.04, 50.61) and *Trichosanthes villosa* (76%, 153.42, 105.32, 55.02), were also important biodiesel candidates. Further studies and targeted breeding of these plants and establish some biodiesel plantations with these plants will better secure our future renewable energy.

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**Oral Session 15:** Lewis/Clark  
**Horticultural Crops Culture and Management:  
Landscape and Turf**  
**Monday, 27 July 2009, 8:00–10:00 am**

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**Moderator: Richard C. Beeson, Jr., rcbeeson@ifas.ufl.edu**

8:00–8:15 am

## Relationship of Transpiration, Reference Evapotranspiration and Tree Size During Six Years of Growth for *Ilex* × ‘Nellie R. Stevens’

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Actual evapotranspiration ( $ET_A$ ) of three *Ilex* × ‘Nellie R. Stevens’ trees was determined continuously for six years using weighing lysimeters, as trees grew from rooted cuttings to 6 m in height. Trees were grown in containers which are increased in diameter incrementally each year. Measured  $ET_A$  was composed principally of transpiration because tops of the containers were covered to limit evaporation. Trees size, consisting of projected canopy area, tree height, and trunk circumference at 15 and 30 cm above substrate level and just below the first major branch collar, were recorded every three weeks. Reference evapotranspiration ( $ET_o$ ) was calculated daily using an on-site weather station. Measured values of trees size were used to normalize  $ET_A$ . Normalized  $ET_A$  values were then modeled as a function of  $ET_o$ . Justification for the best model and its implications will be discussed.

8:15–8:30 am

## A Survey of Urban Tree Damage After a Major Ice Storm Event in Northwest Arkansas

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On 26 January, 2009 during a freezing rain event lasting 12 hours, ice accumulations of up to 4 cm formed on trees at the University