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## Ethnic and Tropical Crops Corner

Hosted by Hong Chen

### Wetland Taro and Lotus Root

In the USDA/IR-4 Crop Grouping Symposium held at Arlington, VA on October 7-8, 2002, lotus root [Nelumbonaceae] *Nelumbo nucifera* Gaertn. and wetland taro [Araceae] *Colocasia esculenta* (L.) Schott, along with Chinese waterchestnut [Cyperaceae] *Eleocharis dulcis* (Burm. F.) Trin. ex Hensch. were grouped to form a new Crop Subgroup 1E - Aquatic Root Vegetables. The suggested representative crops for this subgroup were lotus root and wetland taro. This proposal will be submitted by IR-4 as part of the Crop Grouping Symposium package to the EPA for a full review in April 2003.

Taro is an aquatic perennial plant native to southern tropical marshlands. Numerous varieties of taro known as "Yu" have been cultivated in central and southern China for more than two thousand years. In Hawaii, it was brought in by the earliest Polynesians 1500 years ago and some 300 varieties were grown in the windward valleys of all major islands up to more than 200 years ago. Two major types of taro are the leaf taros, grown primarily for their low astringency edible leaf stalks, and the stem taros grown for their large corms. Taro plants prefer high temperatures, and the production areas are located in tropical or subtropical regions. In Hawaii, due to limited water and agricultural land, it grows only in a few areas such as the Hanalei area on the Island of Kauai (see picture below). Hawaii currently grows about 400 acres of poi taro and 30 acres of Chinese taro with an annual production estimated at about six million lbs., and a sale value of more than \$3 million.

The taro growing season varies from seven to eighteen months with thirteen months being most common. Edible portions of the taro plant are the corms, cormels, and unopened leaves consisting of leaf blades and petioles. Corm yields range from two to eight lb/plant. In some rural areas in southern China, boiled or steamed taro corms

are served on the dinner table like baked or mashed potatoes in American meals. Taro is made into cakes, pies, bread, and "Poi" in Hawaii. Poi, a pounded, paste-like food made from boiled taro corms, is usually served in a traditional Hawaiian food plate with "Lau-Lau," the steamed meats and sticky rice wrapped in well cooked tender taro leaves.



Major pests in wetland taro are leaf blight, Taro Pocket Rot (TPR) disease and golden apple snail. The golden apple snail (*Pomacea canaliculata*) was introduced into Hawaii, Japan and many other countries in Southeast Asia from South America as a human food in the 1980s. However, the commercial markets had quickly failed in all the introduced regions due to the undesirable taste of the apple snail. Unfortunately, the discarded snails escaped to water ditches and invaded taro and rice ecosystems, and they have since been causing significant economic damage to the taro and rice industries. In Hawaii, the wetland taro yield loss caused

by apple snails can reach as high as 25%. Growers spent considerable time and money to control these snails. Since taro and rice are grown in water where there are other aquatic animals sharing the same ecosystems, there are no registered products for snail control in wetland taros. Hand removal and cultural practices are the main control methods. Biopesticides have a lot of potential to fill this niche in wetland taros. Some researchers in Hawaii have recently extracted certain compounds from a tropical plant that have caused high rates of mortality of the apple snails. A full development of such compounds might bring a solution to the management of this pest species.

In Florida, taro production is confined to upland taro since the soils in southern Florida do not retain water well. In addition, wild taro (the padi type), which has escaped cultivation, is now classed as a Category I invasive exotic by the Florida Exotic Pest Plant Council. It is also the subject of a "Weed Alert" by the Florida Department of Environmental Protection. It is not likely that the approach of managing the padi type as an invasive exotic species will change in the foreseeable future.

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Asian populations, lotus roots can be seen in most supermarket vegetable sections. In Florida, lotus root is produced in a small scale due to Florida's very porous soils.

The growing season for lotus root varies from four to eight months. Edible portions of a lotus root are the underwater tuberous-like rhizomes and the seeds from the flower receptacles. The rhizomes can range in size from two to four feet long. Lotus root has a firm, crisp texture. It can be boiled, stir fried, or steamed to make delicious dishes. The dried rhizomes can be made to high quality starch, and in China the lotus root starch is used as baby food or as a special diet for healing sickness. Lotus seeds are also used for food and medicine. In traditional Chinese medicine, it is believed that lotus roots have a property of resolving heat and replenishing vital essence. It promotes the healing process and compliments "Yin" energy. Many Chinese cook lotus seeds in rice soup for women after giving birth or to promote elder health. Tender leaves and petioles of lotus roots are also edible after being detoxified by leaching or cooking for a period of time.

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