Success with Rice Production at Akaogi Farm

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The summer 2008 issue of NOFA Notes featured a story on the rice-growing experiments conducted by Linda and Takeshi Akaogi on their farm in Putney. This introductory article can be found at *www.nofavt.org/resources/nofa-notes*. Since its publication, the Akaogis have continued to gain a tremendous amount of experience and happily, success with growing this crop in Vermont - an unexpected location for paddy rice production.

Rice Paddy at Akaogi Farm - Photo by Cheryl Bruce

In 2008, the Akaogis had already been growing rice in a small 25' x 25' paddy on their farm for two seasons. During this time they conducted small scale trials and had a bit of success getting plants to go to seed, producing grains of rice. However, a Northeast Sustainable Agriculture and Education (SARE) Farmer Grant, awarded that spring, allowed them to take their project to the next level to better evaluate the viability of rice production in the Northeast. They were able to expand their production and grow many more varieties and determine the ability of each to produce a crop.

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To grow their rice, Linda and Takeshi have constructed an actual rice paddy. The paddy is 6-8 inches deep and allows for controlled flooding. Nearby is a reservoir constructed for water storage and heating. Cold water comes into the reservoir and is naturally heated before entering the paddy. Water levels can be controlled during the season and are used to offer plants more protection during periods of cold weather.

The first year of the grant project, they grew 31 varieties in two constructed paddies covering a tenth of an acre. The types of rice conducive to our climate are the short grain or 'Japonica' varieties. For rice growing it is more important to consider the May-September climate than winter coldness. The majority of rice varieties that have grown well at the Akaogi's farm so far are limited to the Hokkaido-bred Japonica varieties.

At the conclusion of the 2008 season, the Akaogis wrote a rice growing manual which is available at *www.uvm.edu/vtvegandberry/Crops/cropindex.html*. This is a step-by-step guide to rice production in the Northeast. Soil requirements, paddy construction, seed germination, transplanting, paddy water temperature requirements, growth habit, and grain harvest are all outlined. That year, they also distributed 150 packets of rice seed to other interested participants.

Building on their success of 2008, a second Northeast SARE Farmer Grant was awarded the following year which allowed for continued variety evaluation. An additional 20-30 varieties of 'Japonica' and some long-grain 'Indica' rice were grown, along with those varieties that had been successful in previous years. To showcase all of their work, Linda and Takeshi hosted an on-farm field day last July. Vermont Secretary of Agriculture Roger Allbee was one of many attendees who came to hear about this exciting project.

Several researchers from Cornell also made the trip to Vermont last summer. Two researchers in particular, Susan McCouch and Gen Fumio Onishi, have been involved with the Akaogis' project since the beginning. One potential opportunity for the future is to develop a breeding program with the university, which has a rice breeding and genetics program. Such a breeding program would work with growers to select varieties that are well suited to the ecological, climatic, and cultural conditions of the region. There are a very limited amount of genetic resources available right now, but a program like this could allow them to move beyond the short-grain, 'Japonica' varieties.

When evaluating varieties in the field, several criteria are used for selection, with date to maturity/harvest being the most important. Other factors include resistance to both disease and lodging (falling over). Takeshi says once varieties are found that meet these criteria, they will then select for yield as well as taste.

Last year, from June through early July, there was a prolonged cloudy day period that resulted in temperatures 5-10 degrees below the average, which significantly slowed down growth rates. However, a few weeks in August with 80 degree temperatures and a rather sunny, dry September sped up the ripening process. As a result, rice crops matured only a few days later than previous years. >>

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The temperatures during panicle development are critical. Temperatures cannot drop below 12 degrees Celsius (53.6 degrees F) for more that 3 days or the pollen inside will be destroyed resulting in a serious loss in yields. Luckily, the Akaogis did not have this problem despite the slow start.

One of the highlights of this project is the continued development of the rice paddy polyculture. The opposite of a monoculture, a polyculture is dependent on ecological relationships. Species monitoring is a key piece of the project and each year new species are observed. However, after four seasons, the paddy now contains animals from the top to the bottom of the food chain including blue heron, frogs, dragonflies, two types of turtles, ducks, sand pipers, tadpoles, insects, and microscopic organisms. Some species use the paddy for feeding, others for a breeding habitat. The system is dynamic and will continue to develop. Takeshi and Linda say that the monitoring of wildlife needs to continue for 3-5 years; however, the biggest challenge is securing funding for this part of their research.

The Akaogis' vision is organic management and beyond, with a focus on biodiversity and restoration of wetland habitat. Over the past 200 years more than 50% of the original 220 million acres of wetlands in this country have been destroyed for agricultural and land development purposes. Rice paddy production can recreate habitats favoring a variety of species within the ecosystem. The construction and agricultural use of a rice paddy system needs to comply with local, state, and federal regulations. Naturally occurring wetlands and streams provide important benefits to water quality, wildlife habitat, and flood storage. A rice paddy system functions as a human-made wetland and can help to create additional habitat to provide some wetland functions. However, rice paddy systems must be constructed outside of wetlands and their designated buffer zones.

Another new development in 2009 was the purchase of a dehuller from Japan. The dehuller turns the harvested rice (also called rough rice) into brown rice by removing the protective hull. This machine allows the Akaogis to dehull a couple hundred pounds of rice at a time. They also hope to obtain a stone remover and potentially a mill. Milling is necessary for removing the bran to make white rice. Last year, the dehulled brown rice was bagged up and sold in individual packages at the farmers' market. As you might imagine, the rice quickly sold out.

The Akaogis estimate that they can produce about 2 tons of rice per acre in the Northeast. Potentially, more rice could be produced than consumed. Americans do not currently consume a lot of rice, as it is not a staple in our

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diet. However, increased availability could lead to increased consumption, especially as a local Vermont product.

This season the Akaogis will begin their fifth year of rice growing. They will continue with their research exploring varieties that are productive while also cultivating their paddy ecosystem. They will also continue their mission to educate others. Their vision is for there to be several other rice growers in our region. These small scale diverse stands would be beneficial in attracting wildlife and utilizing water resources efficiently while sustainably producing grain for local consumption.

Bulk Order 2010

We had over 250 orders this year! Thanks to everyone who helped make the 2010 NOFA Vermont Bulk Order a big success!

Josh Carter and Bobic Vanderpyl help unload. Photo courtesy Kirsten Bower

Our Wonderful Depot Volunteers:

Richmond: *Bobic Vanderpyl and Josh Carter; location donated by Dan Noyes & Richmond Home Supply*

Wolcott: *Paul Betz and High Mowing Organic Seeds, with Joey Klein, Sara & Kyle Schlosser, and Mimi Arnstein*

Shoreham: *Andrea Scott & Bill Suhr, with the Champlain Orchards Staff*

Westminster: *Paul Harlow and Harlow Farm*

Strafford: *Amy Huyffer & Earl Ransom, with Kate & Erik Reimanis*

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