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### UNH Researchers Aim to Re-Domesticate Quinoa for Northern New England

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# NEWSROOM (//WWW.UNH.EDU/UNHTODAY/NEWS)



## UNH Researchers Aim to Re-Domesticate Quinoa for Northern New England

Monday, August 14, 2017

(HTTPS://WWW.UNH.EDU/UNHTODAY/NEWS/2017/08/14/unh-researchers-aim-re-domesticate-quinoa-northern-new-england)

DURHAM, N.H. – Researchers with the New Hampshire Agricultural Experiment Station (<http://colsa.unh.edu/nhaes/>) at the University of New Hampshire have launched a research project that aims to “re-domesticate” the superfood quinoa in northern New England, giving the region’s farmers a new high-value grain crop that is in high demand in the nation.

Researchers are investigating the potential use of a wild/weedy, locally adapted *Chenopodium* species as a breeding partner with quinoa in an effort to "re-domesticate" quinoa into a form suitable for crop production under northern New England’s growing conditions.

“If we can successfully breed or re-domesticate a locally adapted quinoa variety that can be grown with commercial success, it would offer a new option to regional farmers interested in taking advantage of the current, very high price commanded by quinoa as a novel and highly nutritious grain crop,” said experiment station researcher and geneticist Tom Davis. Erin Neff, master’s student in integrative and organismal biology, also is working on the project.



MULTICOLORED QUINOA SEED HEADS GROWN AT THE UNH WOODMAN HORTICULTURAL RESEARCH FARM. CREDIT: UNH

According to the Food and Agricultural Organization of the United Nations, quinoa grain is a nutritional powerhouse that is high in protein, vitamins, and fiber, and low in fat. Quinoa is almost exclusively grown in South America. However, its potential for cultivation elsewhere is being widely explored.

Global production of quinoa has been increasing significantly, surpassing 228 thousand metric tons in 2015, according to Statista. In 2014, the United States was the leading importer of quinoa in the world; U.S. quinoa imports totaled \$159.12 million, or about 68.9 million pounds. The global price of quinoa more than doubled from \$2.96 per kilogram in 2010 to \$6.74 per kilogram in 2014.

According to Davis, the plant genus *Chenopodium* includes the cultivated species, quinoa, and at least one problematic weed, lambsquarters, along with several other wild species in northern New England and about 150 wild species worldwide. So far, researchers have documented the existence of four wild/weedy *Chenopodium* species in northern New England, including the familiar lambsquarters.

One of these currently appears to be the most suitable breeding partner for quinoa. They also have confirmed that several existing, commercial quinoa varieties are challenging to grow successfully as a crop in Durham, and that the fungal disease downy mildew is one of the quinoa production challenges to be overcome by breeding.

“Existing quinoa varieties are adapted to regions with less humid fall seasons, and do not mature well here. However, some of quinoa’s weedy relatives are very successful and well-adapted as weeds in northern New England,” Davis said. “It is always a challenge to ‘get to know’ a new species. We must learn how to grow the plants, how to perform genetic crosses, collect and germinate seed, differentiate among the wild species, and so on. It takes considerable time and effort to learn by doing.”

This material is based upon work supported by the NH Agricultural Experiment Station, through joint funding of the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 1006924, and the state of New Hampshire. This research also has been supported by the work of the Northern New England Collaborative Research Funding Program, a partnership of the Maine Agricultural and Forest Experiment Station, New Hampshire Agricultural Experiment Station, and Vermont Agricultural Experiment Station.

Founded in 1887, the NH Agricultural Experiment Station (<http://colsa.unh.edu/nhaes>) at the UNH College of Life Sciences and Agriculture (<http://www.colsa.unh.edu/aes>) is UNH’s original research center and an elemental component of New Hampshire’s land-grant university heritage and mission.

The University of New Hampshire is a flagship research university that inspires innovation and transforms lives in our state, nation and world. More than 16,000 students from all 50 states and 71 countries engage with an award-winning faculty in top ranked programs in business, engineering, law, health and human services, liberal arts and the sciences across more than 200 programs of study. UNH’s research portfolio includes partnerships with NASA, NOAA, NSF and NIH, receiving more than \$100 million in competitive external funding every year to further explore and define the frontiers of land, sea and space.

#### Editor's Notes:

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(<https://colsa.unh.edu/nhaes/sites/colsa.unh.edu.nhaes/files/media/images/multicolored.jpg>)

Multicolored quinoa seed heads grown at the UNH Woodman Horticultural Research Farm. Credit: UNH

<https://colsa.unh.edu/nhaes/sites/colsa.unh.edu.nhaes/files/media/images/quinoaatunh.jpg>

(<https://colsa.unh.edu/nhaes/sites/colsa.unh.edu.nhaes/files/media/images/quinoaatunh.jpg>)

Study plantation of quinoa, lambsquarters, and other weedy chenopods at the UNH Woodman Horticultural Research Farm. Credit: UNH

<https://colsa.unh.edu/nhaes/sites/colsa.unh.edu.nhaes/files/media/images/tomanderin.jpg>

(<https://colsa.unh.edu/nhaes/sites/colsa.unh.edu.nhaes/files/media/images/tomanderin.jpg>)

Tom Davis and graduate student Erin Neff at a wild chenopod study site. Credit: UNH

<https://colsa.unh.edu/nhaes/sites/colsa.unh.edu.nhaes/files/media/images/downymildew.jpg>

(<https://colsa.unh.edu/nhaes/sites/colsa.unh.edu.nhaes/files/media/images/downymildew.jpg>)

Downy mildew fungal disease on a Chenopodium leaf. Credit: UNH

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