Winter Squash: Extending the Season and Expanding the Uses

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Winter squash is a delicious and nutritious food that can be grown, stored, and eaten in western Oregon from September through March. Currently, the majority of locally grown winter squash is eaten in September through November as storage losses are high. Consumers are increasingly seeking local winter foods; delicious long storing winter squash could meet this demand.

Project Goal and Strategy

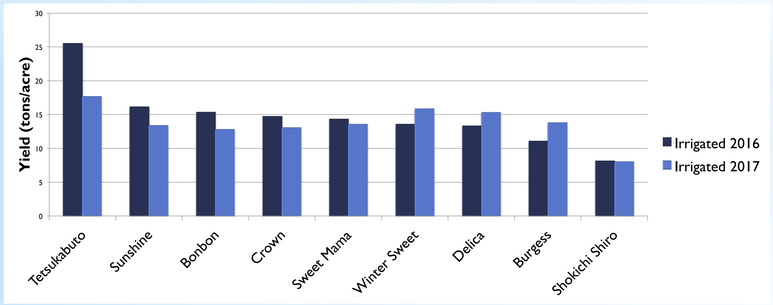
The overall project goal is to increase the consumption of locally grown and stored winter squash from December through March with a focus on kabocha and buttercup varieties.

Strategy

1. Identify high yielding varieties in field trials
2. Identify long storing and rot resistant varieties
3. Evaluate winter sensory quality (Are they flavorful? When are they at best eating quality?)
4. Educate consumers and chefs about the excellent culinary quality and uses for novel squash varieties

1. Identify high yielding varieties through field trials

Yield (fruit size and number) was evaluated for 16 varieties of *Cucurbita maxima* winter squash, including kabochas, buttercups, and one interspecies hybrid variety 'Tetsukabuto'. Average yield (across reps and planting densities) is shown for the top performing varieties below. The main split-plot treatment was full irrigation and no irrigation. Varieties were grown at four planting densities (irrigated and dryland).



2. Identify long storing varieties resistant to storage rots

Squash varieties vary in their susceptibility to storage rot pathogens and maintenance of fruit quality throughout storage. Some varieties succumb to rot pathogens while others are resistant. Some varieties maintain excellent culinary quality for over 6 months, while others lose quality early in storage. We tested the impact of irrigation vs drylaInd and storage environment on storage losses of nine varieties of winter squash.

Irrigated vs. Dryland Production

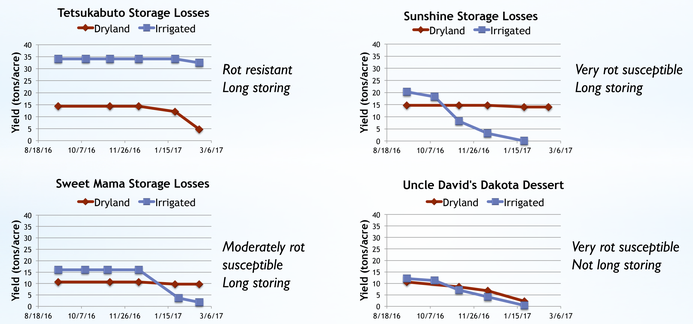
Two different irrigation regimes were used to grow squash for storage: overhead irrigation and dryland production. Dryland squash were watered up and not irrigated thereafter (it does not rain during the summer in western Oregon).

Controlled Environment vs. Barn Bay Storage

Two different storage environments were tested. Most extension publications recommend controlled environment storage to prevent chilling injury and maintain quality., but this is expensive. We stored squash in 1) a controlled environment (52-54° F and 60% relative humidity) and 2) a closed barn bay at ambient RH and above freezing.

There was little difference in storage duration and rot incidence between the two environments. The figures below show results from the controlled environment.

Storage Losses for Four Varieties, Winter 2016-17



In general, dryland-grown squash stored much longer than squash grown with overhead irrigation.

3. Evaluate winter sensory quality

Are they flavorful?

Flavor is complex and subjective. This project aimed to both describe the flavor of the most promising squash varieties as well as gauge consumer preferences for each type.

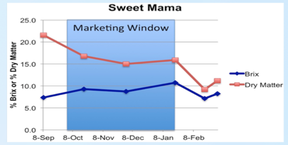
Tastings – Four formal tastings were conducted at several area conferences and farming events and squash were rated on their flavor, texture and aroma. Fifteen excellent tasting squash were identified. These varieties are also high yielding, long storing, and resistant to storage rots.

Flavor Analysis – Chefs worked with Lane Selman and Tim Wastell to develop a flavor lexicon and flavor wheel to help chefs and consumers appreciate the diversity of flavors in winter squash.

When are they at best eating quality?

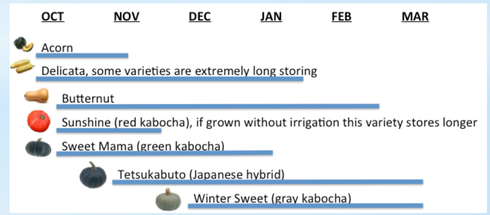
Just like pears, winter squash ripen after harvest and they taste best when they are fully but not overly ripe. Ripeness can be determined using Brix and dry matter along with sensory analysis from trained chefs and consumers

Sweet Mama - A fruity and floral green kabocha that is ripe in October



Winter Sweet – A very long storing gray kabocha that isn't ready to eat until December

Here is a calendar showing the peak culinary quality for common winter squash types, as well as specific high performing varieties identified by this project. This was based on Brix and dry matter data collected monthly throughout the winter.



Top Performing Kabochas and Buttercups

Tetsukabuto – An interspecies hybrid (*C. maxima* x *C. moschata*) that excels in EVERY CATEGORY! Yield, taste, texture, storage rot resistance, and storage duration outshined all other varieties tested.

Burgess
C. maxima, green kabocha

Delica
C. maxima, green kabocha

Bonbon
C. maxima, buttercup

Shokichi Shiro
C. maxima, mini gray kabocha

Sunshine
C. maxima, red kabocha

Crown Pumpkin
C. maxima, gray pumpkin

Sweet Mama
C. maxima, green kabocha

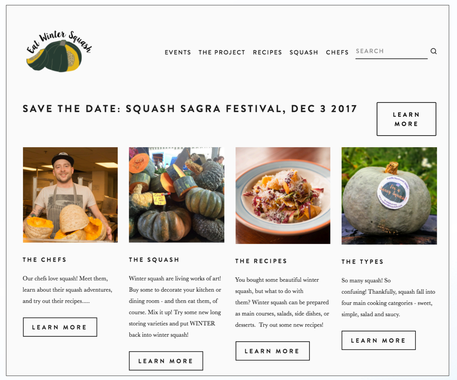
Winter Sweet
C. maxima, gray kabocha

4. Educate consumers and chefs

Product Labels

Many consumers are familiar with butternut and acorn types. But most do not know what a kabocha is! To help farmers sell unfamiliar squash – and consumers to cook with them - we developed culinary categories and produced stickers to inform home cooks about their potential uses. These produce labels send consumers to an informative website with recipes, videos, and variety information.

A Website for Home Cooks www.eatwintersquash.com



Squash Sagra and the 'Fill Your Pantry' Market

The project teamed with Friends of Family Farmers and the Culinary Breeding Network to host a squash festival aimed at educating and inspiring consumers about winter squash.

Conferences and Festivals

The project engaged farmers and consumers at the North Willamette Horticultural Society Conference, Organicology, Oregon Museum of Science and Industry Harvest Festival, and the OSU Small Farms Conference.