



Northern NY Agricultural Development Program

2015 Project Report

Exploring the Potential for Edamame Production in Northern NY

Project Leader:

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Collaborator(s):

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- Robert Weybright (rw74@cornell.edu), Market Development Specialist CCE ENYCHP

Cooperating Producers:

- Adam Hainer, Juniper Hill Farm, Westport (Essex County)
- Delta Keeney, Wind Swept Meadows Farm, Watertown (Jefferson County)
- Dan Kent, Kent Family Farm, Lisbon (St. Lawrence County)

Background:

Forage soybeans are grown across the Northern NY six-county region. This project considered the obstacles to growing and marketing a different form of soy – vegetable soybeans, commonly referred to as edamame. These beans are harvested green and sold as a fresh market crop direct to consumer in the pod, or frozen, either in the pod or removed from the pod.

Northern NY farmers are skilled soybean growers that could adapt to large-scale edamame production with some assistance.

Methods:

Three On-Farm Demonstration Plantings

We had three on-farm demonstration plantings across NNY: one each in Westport (Essex County), Lisbon (St. Lawrence County) and Watertown (Jefferson County).

Westport and Lisbon demonstration plots were planted with a Jang seeder at 10 seeds/foot in double rows 30" apart. Westport plots, planted June 14, were 2 rows, 50' long per variety. Lisbon plots, planted June 12, were 4 rows, 35' long per variety.

The Watertown plots were planted with a 7-row bean planter on June 14.

Weed pressure was a problem season long. The steady rains during June made weed management a challenge for all farms throughout the region.

Willsboro Farm Research Planting

Seven food-grade soybean varieties (see Appendix) were field tested on a Stafford Fine Sandy Loam soil at the Cornell Willsboro Research Farm. A randomized complete block experimental design was used with six replications. Each plot consisted of four 20' long rows spaced 30" apart. 900 lbs/acre Kreher's 5-4-3 pelletized composted chicken manure fertilizer was applied and incorporated into the soil prior to planting.

The target seeding rate for all entries was 8 seeds/ft., and the plots were planted on 6/12/2015.

Weed control included a tractor cultivation on 7/15/2015, and hand weeding on 7/31/2015.

Green soybeans were harvested at the R6 stage on 9/11/2015 and 9/28/2015. Plant height and yield were recorded for each harvested plot.

Regional Specialist Bob Weybright studied the market potential for fresh and frozen edamame in NNY. His report is in the Conclusions section.

Results:

On-farm Demonstration Plantings

Edamame proved to be difficult to establish evenly under the variety of methods and conditions we saw across NNY. All farms experienced mediocre to poor seed germination. *Ginza* had zero germination in all plantings. The other varieties had mixed results on each farm, indicating that the problem was not simply bad seed.

Westport germination as of early July:

- Zero: *Ginza*
- Some: Black Jet and Envy
- Moderate (50% at best): Butterbean, Midori Giant, Chiba Green, Tohya.

Canton germination as of early July:

- None to very little: Envy, *Ginza*, Tohya, Chiba Green
- Moderate: Butterbean, Black Jet, Midori Giant.

The Westport and Lisbon plantings were turned under in mid-July by the growers. The stand was too spotty for efficient tillage and weed management and the space was needed for other crops.

The Watertown farm kept the crop in spite of intense weed pressure. Yields were extremely low. To harvest, plants were cut at ground level and sold in bundles of 4-6 stems for \$3 at their roadside stand. To assess yield on 9/17 we harvested pods from 20 row feet of 3 varieties. Results: *Black Jet* 0.50 lbs, *Envy* 0.94 lbs, *Tohya* 0.62 lbs. The other varieties were not harvestable due to excessive weed pressure. (See Appendix)

Willsboro Farm Research Planting

Seed germination was poor for all the varieties, and one variety, *Ginza*, had zero germination. As a result of the poor stand establishment, we were only able to obtain data from a subset of the plots.

Most of the soybeans varieties were ready to harvest the second week of September, with the exception of *Butterbean*, which matured about two weeks later. *Butterbean* and *Midori Giant* had some decent stands and several rows were harvested for each of these varieties. *Butterbean* and *Midori Giant* also produced the tallest plants and had the highest mean yields (See Appendix).

Conclusions/Outcomes/Impacts:

Willsboro Farm conclusions

Butterbean and *Midori Giant* produced the tallest plants and had the highest mean yields (See Appendix). The stands of the other varieties were not sufficient to allow for a meaningful evaluation of their potential.

To adequately test these food grade soybean varieties, this trial would need to be repeated with viable seed in another field season.

On-farm Demonstration Plantings

Based on experiences at the three farm plantings we have the following conclusions:

- Edamame is not an easy crop for NNY.
- Challenges to growing edamame include:
 - Expensive seed with poor germination,
 - The necessity for irrigation during dry conditions in August for good seed pod fill,
 - The essential need for weed control for at least the first month,
 - Inconsistent pod fill make harvesting and grading time consuming.
- *Butterbean* and *Midori Giant* have greater yield potential but need a longer season to mature than the other varieties.
- Japanese beetles and deer browsing are seriously limiting factors.
- Growers either need access to a bean harvester for labor-saving pod harvest, or sell whole plants in buckets (but at a lower volume)

- Restaurants are curious but are not currently clamoring for fresh edamame.
- Only one grower in our project indicated they would grow it again.
- There is some interest in freezing the pods for winter CSA sales but the low yields are discouraging.

Edamame Market Assessment Summary for NNY, compiled by Bob Weybright, Regional Marketing Specialist

Caveat: The following evaluation work should be considered exploratory in nature, and in no way construed as results that would be found and quantified with a fully-funded in-depth market development project.

In the interest of supporting the economic vitality of the Northern New York (NNY) farmers, a study of preliminary market opportunities for edamame grown in the region was completed in the fall of 2015.

While it was generally found that edamame was familiar in name, a significant number of consumers encountered at meetings attended by the research team, buyer tours, and in general discussions in informal groups at meetings did not have experience eating it. Those that had were very much engaged with it, and fairly regularly purchased it for personal consumption at home. In addition to the experiences of individual consumers it was observed that many restaurants have begun using edamame, in a frozen and shelled format, as an ingredient in dishes. In Asian-themed restaurants edamame is a regular menu item already. This indicates that there is a potential for increasing sales opportunities for edamame that can be grown and processed cost effectively.

This apparent increase in use on a broad basis exists for edamame as a category but there was little to no recognition of there being a number of different varieties grown and sold as edamame. There was even less knowledge of the eating characteristics of each variety (in Asian-themed restaurants as well). This lack of varietal knowledge provides a unique opportunity for the skilled grower in NNY who can successfully grow any of the several varieties showing desirable eating characteristics, and has direct access to the end consumer or buyer to educate and explain the varietal differences.

While there appear to be sales opportunities to both individual and restaurant customers in select areas of NNY, primarily where higher income levels or discretionary spending are occurring, e.g., Lake Placid and Saranac Lake, it was believed, based on past industry experience by the primary research team, that the restaurant channel has the best opportunity to support the development of larger scale edamame production. Evaluations at restaurants, in the Plattsburgh, Lake George and Saratoga areas, to identify and validate varietal differences and establish any interest based upon those attributes found that there is some interest by some “higher end” restaurants to explore purchasing a few of the varieties presented over a period of 6-8 weeks as a special draw to differentiate their menu. The type of restaurant interested in the purchase of fresh edamame is likely to be in the genre of Anthony’s in Plattsburgh, or more affluent tourist trade customers

such as those frequenting the Lake Placid or Saranac Lake regions. Essentially, the best opportunity is with restaurants with a higher price point, allowing for higher ingredient cost.

There was some interest on the part of consumers to purchase edamame fresh and on the stalk at farmer's markets. This individual customer interest was evident in those who are self-proclaimed "foodies," healthy eaters. There was insufficient data to clearly identify demographic and economic parameters associated with a particular market's customer mix, however, these would be more likely across income levels rather than geographic lines. There are indications that sales potential at markets are likely correlated to some of these variables.

Fresh edamame is a niche product in NNY. Virtually all edamame currently purchased in NNY is frozen. Quite frequently it is machine harvested, with significant field damage resulting and very color and size consistency reported. We notice during the time of evaluation that the variety appeared to change in the retail-available product, and the price of the frozen commodity is relatively low. There needs to be additional study to better understand the growing of, and equipment/infrastructure needed to have consistent and successful crop to develop and maintain a fresh market alternative to commodity frozen edamame. Customer education on the varietal differences and their unique attributes as an alternative to commodity edamame will be required to support the required price premium. That said, data was insufficient to establish realistic price indicators for Northern NY-grown edamame production to be profitable.

Next Steps:

Production needs to be a primary focus, but market assessment with known prices also needs to be incorporated throughout as there is a very narrow window of price advantage heavily dependent on very tight and high standards of product handling and quality grading. Without more convincing data, we are reluctant to promote growing edamame in NNY.

Outreach:

- We did not hold field meetings due to the poor stands.
- Results and market potential were discussed at the Northern Vegetable School in Keeseville on March 14, 2015, with 44 growers. Samples of frozen pods of a few varieties were steamed and sampled by attendees.

Appendix – Edamame

Willsboro Farm

Planted 6/12/15 with a 4-row bean planter

On 7/11/15:

- Zero germ: Ginza
- Poor germ: Black Jet, Chiba Green, Envy
- Mediocre germ: Toyha
- Decent germ: Butterbean, Midori Giant
-

Weed control maintained for first half of season; by August it was very dry and weeds got ahead. Crop would have benefited from rain or irrigation. Harvested 9/11/15 and 9/28/15.

Plant Establishment	
Willsboro Farm	Avg # plants/20' row (5 reps)
Black Jet	11
Butterbean	39.5
Chiba Green	6.5
Envy	7.3
Ginza	0
Midori Giant	44.7
Tohya	17.1

2015 Edamame Variety Trial Results Cornell Willsboro Research Farm				
Variety	Harvest Date	#Rows Harvested	Mean Height (ft)	Mean Yield (lbs/20' row)
Ginza	Did not harvest	0		
Black Jet	9/11/2015	2	1.60	3.44
Butterbean	9/28/2015	6	1.96	7.35
Chiba Green	Did not harvest	0		
Envy	9/11/2015	1	1.44	2.09
Midori Giant	9/11/2015	7	1.69	6.19
Tohya	9/11/2015	1	1.25	4.07



Photos from the Willsboro Farm, 9/11/15, left to right: section of planting pre-harvest, *Midori Giant* at harvest, *Toyha* at harvest. Photos: Amy Ivy.

Watertown Planting

First harvest on 9/7/15; harvest continued as needed for farm stand into late September.

Sold in bundles of stems, like a bouquet of flowers, kept fresh in a bucket of water. 4-6 stems/bundle for \$3.00 at stand.

Grower comments:

- Envy is the favorite, likes the leaf canopy above the pods, keeps the deer from getting at the beans.
- Toyha is the next favorite.
- Black Jet is the third favorite, taller with bigger pods that are easier to harvest.
- Butterbean and Midori Giant take longer to mature, not the best fit for climate and timing. Did not get harvestable pods this year.
- Overall grower was pleased and plans to grow edamame again next year.

Watertown	Pounds of pods/20' row 9/17/15
Black Jet	.50
Butterbean	Not harvested
Envy	.94
Midori Giant	Not harvested
Tohya	.62



Photo left: Weed pressure and spotty stand typical of the on-farm demonstrations, 7/14/15. Photo by Amy Ivy.

Photo below: Amy Ivy planting with the Jang planter, 6/14/15. Photo by Crystal Stewart.

