

Edamame (Vegetable Soybean) Variety Trial at Neely-Kinyon Farm-2001

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Introduction

Interest in edamame or vegetable soybeans has increased in the U.S. in recent years. Edamame soybeans are harvested immature, similar to green beans. Immature soybeans have less of a “beany flavor,” which appeals to American consumers. Edamames are boiled and served either in or out of pods, usually eaten as a snack or in soups, salad, or as a vegetable dish. Edamames are usually harvested at 85% pod fill. Pod color and size can be employed as quality indicators, with high quality pods having 2 - 4 seeds/pod and pod length around 2.5 inches. Insect- and disease-free pods should be harvested. Chilling beans for 3-10 hours after harvest will help limit sugar and amino acid degradation. In 2001, edamame research trials were established on organic fields at the ISU Neely-Kinyon Farm and processed at Iowa State University to determine yields and taste.

Materials and Methods

Three varieties of edamame soybeans (IA1007, IA2025 and Envy from Johnny’s Seeds, Albion, ME) were planted on May 29 at 125,000 plants per acre. Plots were harrowed on June 8, and row cultivated on June 22, July 8 and August 23. Stand counts were made on July 5, 2001. Because a mechanical bean picker was not available in 2001, edamames were hand-harvested. A sample harvest from two 30-ft rows of Envy was taken on August 13, 2001, when pods were green and full. Three 30-ft rows of the other two varieties were also hand-harvested: IA2024 on August 20, and IA1007 on August 30, 2001. Soybeans were blanched at the Department of Food Science pilot plant using a culinary blancher. ‘Envy’ was shelled post-blanching and pre- and post-shelling weights recorded. Because edamames in first-year trials were shipped over a substantial distance, soybeans were blanched and frozen to prevent oxidation.

Results and Discussion

There were significantly greater ‘IA2024’ plant populations at 38 DAP compared to the other two varieties (Table.1). Despite the greater plant population, no significant yield differences were found among the varieties (Table 2). Excellent yields were obtained, averaging 5,849 to 10,880 lb./acre, with ‘IA1007’ producing the highest yields, ‘IA2025’ intermediate, and ‘Envy’ producing the lowest yields. After discussion with edamame growers, it was determined that ‘Envy’ should have been harvested a week later. We will adjust harvesting schedules in 2002 based on this recommendation. Bean leaf beetles were present in these trials, although plant health was not impacted.

Table 1. Plant populations at 38 days after planting, 2001.

Variety	Stand count \pm SE
IA1007	53,000.40 \pm 700.20
IA2025	100,000.80 \pm 900.68
Envy	65,000.80 \pm 600.05
LSD	24,000.01

Table 2. Edamame yields, 2001.

Variety	Yield (lb/ac) \pm SE
IA 1007	10,880 \pm 1178
IA 2025	7,934 \pm 2037
Envy	5,849 \pm 127.78
LSD	NSD

When ‘Envy’ pods were shelled post-blanching, the pre-shelling weight of 5,849 lb/ac produced 2,000 lb/ac of shelled beans. Although shelling post-blanching required less labor than pre-blanching, processing costs must include these labor costs.

In addition to the challenge of determining which varieties perform best in terms of yield, seed size, taste, color, and nutrition, harvesting poses an additional challenge requiring further studies. Edamames should be harvested when the optimum combination of sugar, amino acid content and pod fill is obtained. The fact that sugar and amino acid concentration peak before complete pod fill provides additional challenges to growers. Unlike most soy products, edamames require minimal, but essential, equipment and processing protocols for maintaining quality. Edamames can be sold fresh in Farmers’ Markets, stores or at roadside stands as bundled plants, and sold fresh or frozen in pods or as shelled beans. Several edamame operations utilize hand harvesting, but labor costs may seriously impact the profitability of this crop. Neely-Kinyon organic edamames were served at Field Days and received high grades for excellent taste. Further studies will be conducted in 2002 to determine the potential of green bean mechanical harvesters through a Specialty Grants Program with the Iowa Department of Agriculture and Land Stewardship.

References

Washington State University’s Edamame Program, <http://agsyst.wsu.edu/edamhome.html>