

## Edamame (Vegetable Soybeans) Variety Trial at the Neely-Kinyon Farm, 2001

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### Introduction

Interest in edamame, or vegetable soybeans, has increased in the United States in recent years. Edamame are harvested when immature, similar to green beans. Immature soybeans have less of a “beany flavor,” which appeals to American consumers. Edamames are boiled, then served either in or out of pods as a snack or in soups, salads, or vegetable dishes.

Edamames usually are harvested at 85% pod fill. Pod color and size can be used to assess quality, with high-quality pods having 2–4 seeds/pod and a pod length of approximately 2.5 inches. Beans are chilled for 3–10 hours after harvest to 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 yield and taste.

### Materials and Methods

Three varieties of edamame soybeans (IA1007, IA2024, and Envy from Johnny’s Seeds, Albion, ME) were planted May 29, 2001 at 125,000 plants/acre. Plots were harrowed June 8, then row cultivated June 22, July 8, and August 23. Stand counts were made on July 5.

Because a mechanical bean picker was not available in 2001, edamames were hand-

harvested. A sample harvest from two 30-foot rows of Envy was taken on August 13 when pods were green and full. Three 30-foot rows of the other two varieties also were hand-harvested: IA2024 on August 20, and IA1007 on August 30. Soybeans were blanched at the Department of Food Science pilot plant using a culinary blancher. Envy was shelled post-blanching, with pre-shelling 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 with 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 5,849–10,880 lbs/acre, with IA1007 producing the highest yields, IA2025 being intermediate, and Envy producing the lowest yields. After discussion with edamame growers, it was determined that Envy should have been harvested a week later. Harvest schedules will be adjusted in 2002 based on this recommendation. Bean leaf beetles were present in these trials, although plant health was not impacted.

When Envy pods were shelled post-blanching, a pre-shelling weight of 5,849 lb/acre produced 2,000 lb/acre 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 can be obtained. The fact that sugar and amino acid concentration peak before complete pod fill, provides an additional challenge for growers. Unlike most soy products, edamames require minimal, but essential equipment and processing protocols to assure quality. Edamames can be sold fresh at farmers' markets, stores, or at roadside stands as bundled plants and sold fresh or frozen in pods

or as shelled beans. Several edamame operations use hand-harvesting, but labor costs can seriously impact profitability. Neely-Kinyon organic edamames were served at field days and received high grades for excellent taste. Through a specialty grant program of the Iowa Department of Agriculture and Land Stewardship, further studies will be conducted in 2002 to determine the potential of using green bean mechanical harvesters to harvest edamames.

**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