COOPERATIVE EXTENSION
WASHINGTON STATE UNIVERSITY

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Washington State University Edamame Variety Trial

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Introduction

Until the beginning of our research program in 1995, edamame varieties had not been tested extensively or developed specifically for production in western Washington. Environmental factors in the area, such as acid soils and low heat unit accumulation, influence variety performance. We have been testing commercial varieties currently available in the USA and some advanced breeding lines from the Asian Vegetable Research and Development Center (AVRDC) in Taiwan for production in western Washington. Seed from breeding lines which performed well in these trials was saved and are being used for variety development for the area.

Plant Stands

In three years of variety trials (1995, 1996 and 1997), 18 commercial varieties and 28 breeding lines were tested at an on-farm location in Chehalis. In our trials, optimum plant stand, 60 plants per 3 meters of row, was not achieved (Table 1).

Table 1. Number of plants harvested in 3 m row in Chehalis, WA in 1995, 1996 and 1997.

Variety	1995	1996	1997
Envy	34		52
Butterbeans	31	54	59
Lucky Lion	34	43	30
Gion	24	13	29
White Lion	23	41	12
Early Hakucho	28	3	25
Sapporo Midori	0	18	15
Sayamusume	22		
Shironomai	37	44	55
Kegon	0	0	50
Fiskeby V	34	4	
Shirofumi	6		39
Osodefuri 200		9	
Tokita 214		1	
JSM0168		41	
JYKO189		36	
JSY1004		48	
Mikawahima 202			6
Soya #203			1

Poor plant stands were due in part to lack of seed grading. We observed that edamame seed packages contained variably-sized seed, and although we calibrated our seed plate for the larger seed, one large seed would block the seed hole, resulting in skips and necessitating us to go back and plant the row over, ultimately resulting in poor plot stands.

Yields

Shironomai, White Lion, Butterbeans, Lucky Lion, and Gion, performed well in our trials (Table 2). Seed from Butterbeans is produced by Johnny's, a Maine-based company, and sells for around $5 a pound. Seed for the other 4 varieties was imported from Japan and is readily available in the United States, though can be expensive and can cost up to $18 a pound. Seeding rates are approximately 85 pounds to the acre, so for commercial production, seed costs are significant. An ultimate goal of this project is to develop varieties for the area and to establish seed production in the United States in order to reduce the high cost of planting.

Table 2. Marketable yields (g) in 3 m row of edamame varieties grown in Chehalis, WA in 1995, 1996, and 1997 and the mean yields of 2 or 3 years.

Variety	1995	1996	1997	Mean
Shironomai	743	728	931	**801**
White Lion	810	731	585	**708**
Butterbeans	663	770	617	**683**
Lucky Lion	614	736	593	**648**
Gion	687	321	735	**581**
Kegon	0	0	1382	
Shirofumi	220		586	**403**
Sapporo Midori	0	408	397	**402**
Envy	332		379	**355**
Early Hakucho	495	120	468	**361**
Sayamusume	699			
Fiskeby V	631	61		**346**
JSY1004		884		
JSM0168		663		
Osodefuri 200		472		
JYKO189		536		
Tokita 214		22		
Soya #203			360	
Mikawahima 202			321	

Earliness

We found that all varieties were harvested more than 40 days later than their advertised days to maturity. In our study, varieties matured on average 117 days after planting, or in early September. Earliness is key to suitability for the area, and varieties which are advertised as maturing in more than 80 days will not mature in western Washington.

Bean Size

We have found that irrigation is necessary for edamame production in western Washington if the beans are intended for the vegetable market. In 1995, we irrigated plots only once, in late-July, and insufficient soil moisture resulted in very small beans (Table 3). Smaller-sized beans are suitable for the sprout market but not for the vegetable market where 25 beans should weigh 20 grams or more.

Table 3. Weight (g) of 25 beans of edamame varieties harvested in Chehalis, WA in 1995, 1996, and 1997 and the mean yields of 2 or 3 years.

Variety	1995	1996	1997	Mean
Shironomai	12.4	25.8	31.0	**23**
White Lion	15.2	26.4	40.0	**27**
Butterbeans	11.9	25.8	29.5	**22**
Lucky Lion	11.4	28.9	32.5	**24**
Gion	13.3	35.0	33.3	**27**
Kegon			31.3	
Shirofumi	14.0		30.0	**22**
Sapporo Midori		28.9	32.0	**30**
Envy	9.7		20.7	**15**
Early Hakucho	12.6	28.8	18.3	**20**
Sayamusume	18.1			
Fiskeby V	9.1	20.0		**15**
JSY1004		35.0		
JSM0168		24.4		
Osodefuri 200		32.3		
JYKO189		26.1		
Tokita 214		22.3		
Mikawahima 202			26.0	

Variety Development

We have selected five AVRDC breeding lines which we are advancing for variety development for southwest Washington. It is our hope that in a few years these newly developed varieties will be available to local growers edamame vegetable and seed production. In this way, we are working to establish two new crops for the region; the first is the vegetable crop and the second is the seed crop.

Web Site

This research report along with information regarding edamame planting, maintenance and harvesting is published at our web site *http://agsyst.wsu.edu/edam.htm*

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