

Daikon Variety Trials at the UH Poamoho Experiment Station

Oahu, Hawaii, November 2008

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Above, Ted Goo washing roots prior to data collection.

Left and below, closeup and overview of the field trials at the UH Poamoho Experiment Station.

Daikon Variety Trials at the UH Poamoho Experiment Station, Oahu, Hawaii 2008

Table 1. Mean growth and marketable yield of several long daikon varieties grown during the winter months at the UH Poamoho Experiment Station in Oahu, Hawaii, 2008. (About 800 feet elevation). **Metric values.**

Cultivar	Root wt. (Kg)	Root Length (cm)	Diameter Root (cm)	Top Growth Wt (Kg)	Top/Root ratio (%)	CV (N)	Total Yield (Kg/15 ft)	Yield (lb/Acre)
Omny	1.29a	40.5b	7.2ab	0.71a	58ab	26.1 (25)	32.3	61,585.3
April Cross	1.24ab	48.5a	6.4def	0.50bc	41de	25.7 (24)	29.8	56,818.7
Honjikomi	1.17abc	47.2a	6.1f	0.52bc	49bcd	30.5 (25)	29.3	55,865.3
Spring Romance	1.11bc	40.0b	6.8bcd	0.48bc	44cd	21.5 (18)	20.1	38,324.0
Discover	0.86e	39.8b	6.3def	0.24e	28f	19.6 (26)	22.4	42,709.3
Kyoto Flash	1.06cd	34.2c	6.9bc	0.55b	57ab	34.4 (24)	25.5	48,620.0
Shinjin	0.94de	33.3c	6.5c-f	0.39d	43cd	18.0 (29)	27.3	52,052.0
New Crown	0.89e	33.2c	6.8bc	0.49bc	56ab	21.9 (25)	22.4	42,709.3
White Cannon	0.85e	31.0cd	6.9bc	0.52bc	62a	21.1 (24)	20.4	38,896.0
Spring Joy	0.83ef	31.1cd	6.7cde	0.28e	33ef	18.5 (31)	25.8	49,192.0
Everest	0.70gf	31.3cd	6.3ef	0.26e	39de	26.1 (22)	15.4	29,362.7
Everest Fukuda	0.57gh	29.6de	5.6g	0.22e	42cd	27.7 (22)	12.6	24,024.0
Kenka	0.93de	28.8de	7.3a	0.45c	51bc	21.2 (24)	22.4	42,709.3
Qkon	0.93de	27.5e	7.5a	0.25e	29f	20.1 (17)	15.8	30,125.3
Short Fukuda	0.46h	15.8f	6.9bc	0.28e	61a	18.7 (22)	10.1	19,257.3

Notes:

1. Within columns, numbers followed by the same letter are considered to be statistically similar according to Duncan's new multiple range test (P<0.05).
2. Plants were sowed on Jan. 9, 2008. The first roots were harvested on Feb. 26, and thereon the field was harvested weekly until March 25th.
3. The top to root ratio on column No. 5 is the ratio of the top growth weight divided by the root weight, multiplied by one-hundred. A lower to top:root ratio, indicates that more resources are devoted towards root growth.
4. The Coefficient of Variation (CV) on column 6 is an indication of root uniformity within each variety. Lower CV values indicate a greater/better root uniformity. The value N on column 6 indicates the number of individual roots that were harvested for each variety.
5. Yields per acre were extrapolated from the yields obtained on this experiment (15 ft rows per variety, with a spacing of 1.5 ft planted on staggered double rows per bed). Per acre yields were estimated based on about 13,000 linear foot per acre (assuming 3 ft between rows).

Daikon Variety Trials at the UH Poamoho Experiment Station, Oahu, Hawaii 2008

Table 2. Mean growth and marketable yield of several long daikon varieties grown during the winter months at the UH Poamoho Experiment Station in Oahu, Hawaii, 2008. (About 800 feet elevation), English values.

Cultivar	Root wt. (lb)	Root Length (inch)	Diameter Root (inch)	Top Growth Wt (lb)	Top/Root ratio (by weight, %)	CV (N)	Total Yield (lb/15 ft)	Yield (lb/Acre)
Omny	2.8a	15.9b	2.8ab	1.6a	58ab	26.1 (25)	71.1	61,585.3
April Cross	2.7ab	19.1a	2.5def	1.1bc	41de	25.7 (24)	65.6	56,818.7
Honjikomi	2.6abc	18.6a	2.4f	1.1bc	49bcd	30.5 (25)	64.5	55,865.3
Spring Romance	2.4bc	15.7b	2.7bcd	1.1bc	44cd	21.5 (18)	44.2	38,324.0
Discover	1.9e	15.7b	2.5def	0.5e	28f	19.6 (26)	49.3	42,709.3
Kyoto Flash	2.3cd	13.5c	2.7bc	1.2b	57ab	34.4 (24)	56.1	48,620.0
Shinjin	2.1de	13.1c	2.6c-f	0.9d	43cd	18.0 (29)	60.1	52,052.0
New Crown	2.0e	13.1c	2.7bc	1.1bc	56ab	21.9 (25)	49.3	42,709.3
White Cannon	1.9e	12.2cd	2.7bc	1.1bc	62a	21.1 (24)	44.9	38,896.0
Spring Joy	1.8ef	12.2cd	2.6cde	0.6e	33ef	18.5 (31)	56.8	49,192.0
Everest	1.5gf	12.3cd	2.5ef	0.6e	39de	26.1 (22)	33.9	29,362.7
Everest Fukuda	1.3gh	11.7de	2.2g	0.5e	42cd	27.7 (22)	27.7	24,024.0
Kenka	2.0de	11.3de	2.9a	1.0c	51bc	21.2 (24)	49.3	42,709.3
Qkon	2.0de	10.8e	3.0a	0.6e	29f	20.1 (17)	34.8	30,125.3
Short Fukuda	1.0h	6.2f	2.7bc	0.6e	61a	18.7 (22)	22.2	19,257.3

Notes:

1. Within columns, numbers followed by the same letter are considered to be statistically similar according to Duncan's new multiple range test ($P < 0.05$).
2. Plants were sowed on Jan. 9, 2008. The first roots were harvested on Feb. 26, and thereon the field was harvested weekly until March 25th.
3. The top to root ratio on column No. 5 is the ratio of the top growth weight divided by the root weight, multiplied by one-hundred. A lower to top:root ratio, indicates that more resources are devoted towards root growth.
4. The Coefficient of Variation (CV) on column 6 is an indication of root uniformity within each variety. Lower CV values indicate a greater/better root uniformity. The value N on column 6 indicates the number of individual roots that were harvested for each variety.
5. Yields per acre were extrapolated from the yields obtained on this experiment (15 ft rows per variety, with a spacing of 1.5 ft planted on staggered double rows per bed). Per acre yields were estimated based on about 13,000 linear foot per acre (assuming 3 ft between rows).

Table 3. Weekly total weight (and percent of total weight) of several daikon varieties harvested over time at the UH Poamoho Experiment Station, Oahu, Hawaii (about 800 feet elevation).

Cultivar	Feb. 26. (48 DAP) (Kg) & (%)	March 4 (55 DAP) (Kg) & (%)	March 11th (62 DAP) (Kg) & (%)	March 18th (69 DAP) (Kg) & (%)	March 25th (76 DAP) (Kg) & (%)	Total weight kg (lbs) & (%)
Omny	0.88 (2.7%)		4.8 (14.9%)	19.7 (61.0%)	6.9 (21.4%)	32.3 (100%)
April		5.0 (16.8%)	15.9 (53.3%)	8.9 (29.9%)		29.8 (100%)
Honjikomi		3.3 (11.3%)	5.5 (18.8%)	18.7 (63.8%)	1.7 (5.8%)	29.3 (100%)
Spring Romance		7.6 (37.8%)	7.4 (36.8%)	5.1 (25.4%)		20.1 (100%)
Discover			4.6 (20.5%)	16.3 (72.8%)	1.5 (6.7%)	22.4 (100%)
Kyoto Flash			7.8 (30.6%)	13.9 (54.5%)	3.8 (14.9%)	25.5 (100%)
Shinjin			14.7 (53.8%)	12.6 (46.1%)		27.3 (100%)
New Crown			5.6 (25.0%)	14.8 (66.0%)	2.0 (8.9%)	22.4 (100%)
White Cannon		8.9 (43.6%)	6.4 (31.4%)	5.1 (25.0%)		20.4 (100%)
Spring Joy		10.2 (39.5%)	8.4 (32.5%)	6.6 (25.6%)	0.57 (2.2%)	25.8 (100%)
Everest	1.3 (8.4%)	7.8 (50.6%)	6.3 (40.9%)			15.4 (100%)
Everest Fukuda	2.5 (19.8%)	10.1 (80.1%)				12.6 (100%)
Kenka			10.5 (46.9%)	10.3 (46.0%)	1.6 (7.1%)	22.4 (100%)
Qkon	2.6 (16.4%)	11.0 (69.6%)	2.2 (13.9%)			15.8 (100%)
Short Fukuda	10.1 (100%)					10.1 (100%)

Note. DAP= Days after Planting. The plants were direct-seeded.

This table indicates the total root weight harvested on each weekly harvest. The number in parenthesis indicates the percent of the total final harvest, picked on that individual week. Roots were harvested each week based on a visual estimate of their size and maturity. Early varieties (48 days after planting) in this trial included the smaller-rooted varieties: Short 1041, Everest (Fukuda Seed), and Quon. Later-season varieties (about 70 days after planting) included: Omny, Honji, Discover, and New Crown.

Top 3 Yielding Varieties at UH Poamoho Station, ca 800 ft elevation, Winter Trials



Omny



April Cross



Honjikomi



Spring
Romance



Everest



Q-Kon



Spring
Joy



Shinjin



Discovery



Kyoto
Flash



New
Crown



White
Cannon



Kenka



Short
(Fukuda)



Daikon Varieties that Performed well in Statewide trials, 1990s



Daikon Trials at UH Waimanalo Station, to evaluate root uniformity of 'High Snow' to use as a replacement of 'Chinese Improved Early'



'High Snow' roots look nice but poor/low overall uniformity

'High Snow' Harvested Feb. 27th

N= 282 roots for analysis

Average Length= 5.5 in

Diameter= 2.2 in

Root weight= 0.81 lbs

(range wt. 0.1 to 1.8 lbs/root)

Top foliage wt= 0.52 lbs

Top:Root ratio= 65%

Total weight per plot= 230 lbs

CV (uniformity index)= 52.6

Note: Coefficient of Variation (CV) is a statistical parameter useful to determine general crop uniformity.

Organic Daikon Demonstrations, Waimanalo

Daikon was grown periodically at the UH Waimanalo Organic plots from 1993 to 2000. Chinese daikon varieties reached yields of 270 lbs/100 ft row or ca 35,000 lbs/Acre

Yields for other varieties: hybrid daikon, 150 lbs/100 ft row or 19,500 lbs/Acre; long daikon varieties, 180 lbs/100 ft row or 23,400 lbs/Acre.

Daikon leaves tissue nutrient level, Organic plots

Nutrient	Leaf tissue levels
Nitrogen	3.8%
Phosphorus	0.54%
Potassium	3.7%
Calcium	3.1%
Magnesium (Mg)	0.58%
Sodium (Na)	0.74%
Manganese (Mn)	33 ppm
Iron (Fe)	166 ppm
Copper (Cu)	6 ppm
Zinc (Zn)	28 ppm
Boron (B)	45 ppm

Below organic mulch trial with daikon



Below, weedy and clean daikon trial, at the long-term Waimanalo Organic Research Plots



On-farm Organic Daikon Demonstrations, Central Oahu to evaluate the effect of different compost sources on the yield of daikon, cvr Aoguki (Green shoulder, Japanese type)



Above, on left, view of compost plot (composted vegetable residues with chicken manure); on right, unfertilized control.

Nutrient	16-16-16	16-16-16	Compost	Compost
(leaf)	Expt. 1	Expt. 2	Expt. 1	Expt. 2
N	6.4 %	4.7%	6.8%	5.1%
P	0.53%	0.36	0.52	0.45
K	5.2	3.0	7.4	4.8
Ca	4.9	2.8	3.6	2.0
Mg	0.55	.035	0.51	0.25
Na	1.32	0.28	0.90	0.38
Mn	75 ppm	35 ppm	99 ppm	32 ppm
Fe	661	718	562	439
Cu	28	9	20	13
Zn	22	18	36	42
B	29	32	38	38

Summary:

In this on-farm experiments we evaluated 4 different types of composts, and synthetic fertilizer (16-16-16) on daikon yields. The compost at 10 tons per acre was applied 3 months prior to planting. The best yields were obtained with composts made from vegetable residues and chicken manure.

Tissue samples (see table on left) were collected, to compare nutrient levels on the leaves.

Daikon Cultivar Descriptions and Sources

April Cross (Takii). Extra low bolting, vary late pithiness. White neck, 16 in long, 1.5-2 lb, excellent quality for cooking, pickling, salad. In Hawaii performed well across locations, Poamoho, Summer; Kamuela, Winter; Volcano, Spring.

Discovery (Takii), very long roots, nice; Improved April Cross type, slow bolting habit and late pithiness as April Cross, Uniform root with excellent field holding ability, a bit shorter than April Cross; white neck, 38 cm long, 7 cm diam, 800 g weight,

Everest (Takii) white shoulder, long stubby roots, A tropical Chinese radish hybrid, Everest has attractive white skin and finely textured flesh. Late pithiness. 14 inches in length, 2 to 2.5 inches in diameter, weight is 1.5 lbs.

High Snow (Know You). Hybrid. Plants are large, vigorous and early. Roots are 10 in long and 3 in diameter, about 2 lbs. Straight, white skin, and flesh, fine texture and high yielding. Good for warm season planting.

Honjikomi (Kaneko), nice long roots white shoulder, nice top growth

Kenka (Sakata) nice roots, green shoulder

Kyoto flash (Marutane). Japanese long white. Nice root, nice top growth, About 13 in long and 3 in diameter, 2 lb each. Neck color is green, good mild taste. In Hawaii performed well across locations, Poamoho, Summer; Volcano, Spring;

Mikura (Sakata)- Characteristics of Okura stump-rooted and

Mino Early Sakata's Improved. Roots with uniform thickening down to the tip giving a long cylindrical shape. Resistant to yellows and virus.

Ming Ho (Know-You)- Tolerant to Turnip Mosaic, 45 days, root is 1.5 lb, 9.8 in long, 2.5 in wide. Flesh is white, tender and mild. Not adapted to cool conditions.

Minowase Summer Cross No. 3 (Takii). Resistant to virus, fusarium, and heat. Excellent quality, white neck, 16 in long, 1.5-2 lb, excellent quality for cooking, pickling, salad.
Mino Early Long (Takii)-

Marumi (Mikado), green shoulder. In Hawaii performed well across locations, on Poamoho, Kamuela and Volcano, all during the Winter and Spring.

Nova Shogoin (Marutane). Japanese ball type, about 6 in long and 6 in diameter, weight per root is about 2 lbs, light green neck color.

Daikon Cultivar Descriptions and Sources, continues.

New Crown (Fukuda Seed Store, Takii?). Nice root, green shoulder

Okura (Sakata)- Flesh is crips with a little pungency, suited for salad, pickle and cooking. 65 days. Performed well in Volcano during summer planting.

Omny (Sakata). F-1 hybrid. More vigorous than All Season. Tolerant to premature bolting. Slightly green on neck end. Suitable for close planting. Root about 16 in long. Virus, black rot and soft rot tolerant. Performed well during winter in Kamuela.

Q-Kon (Marutane), Japanese, Chinese type, short stubby green shoulder

Relish Cross (Takii). Excellent quality, very late pithiness, green neck, 15 in long, 1.5-2 lb, good quality for cooking, pickling, salad. High tolerance to virus.

Red Coat (Know You). Plants are small, erect, vigorous, tolerant to TuMV, good for close planting. Straight roots are about 8 in long and 2 in diameter. Purple-red skin and flesh, suitable for salad.

Shariki (Kyowa). Hybrid. Compact and erected leaves with green shoulder. Weighs about 3 lb and is 14 in long and 2.5 in diameter.

SDA 0103 (Sakata), in Hawaii performed well across locations (Poamoho, Summer; Volcano in the Spring).

Shinjin (Kaneke), very nice roots, green shoulder, cannon shape

Short (Fukuda Seed Selection), short stubby white shoulder

Spring Joy (Marutane). Japanese long white, green shoulders, nice uniform roots, Very slow bolting, about 12 in long, and 4 in diameter, neck color is green, Suitable for greenhouse production, easy growing and excellent taste. Performed well in Volcano during Spring planting.

Spring Romance (Marutane), long root, green shoulder.

Summer Mino Early (Marutane). Japanese long white, heat resistant, root about 18 in long, and 2 in diameter, neck color is white, medium slow bolting, tolerant against virus, black rot and soft rot, grows well in subtropical areas, excellent uniformity and easy to grow.

White Cannon (Fukuda Seed, Takii), nice roots, uniform, green shoulder, nice top growth, maturity 58 days, medium late, pithiness late, light green neck, 800 gr weight, length 28-30 cm, diam 9 cm,

Seed Companies

Fukuda Seed Store, Oahu
1287 Kalani St., No. 106
ATTN: Jo-Anne A. Kaneshiro
t. 808-841-6719
kriskaneshiro@hotmail.com

Kaneko Seed Co.
<http://www.kanekoseeds.jp/english/index.html>
ATTN: Mr. A. Nakajima
email: oversea@kanekoseeds.jp

Kyowa Seed Co., Ltd (Harris Moran Brand)
15-13 Nanpeidai
Shibuya-ku
Tokyo 150, Japan
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Marutane Co. Ltd.
C.P.O. Box 65
Kyoto 600 Japan
ATTN: Mr. Yoji Ishihara
seed@marutane.com

Mikado Seed Growers Co.,
1203 Hoshikuki
Chiba City 280 Japan
mikado@green.ocn.ne.jp

Sakata Seed America Inc.
(also seed Fukuda Seed)
ATTN: Yasuhisa (Yasu) Hasegawa
YHasegawa@sakata.com
www.sakata.com

American Takii, Inc.
(See: Fukuda Seed)
<http://varieties.takii.com/default.asp?type=Vegetable>
t. 831 443-4901

Acknowledgments: Thankyou to: the listed seed companies for supplying seed samples; to the staff at Poamoho Experiment station for excellent field maintenance, and help with harvest and data collection.



Above, daikon in Japan, for sale in road-side stands, below daikon for processing, Volcano

