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CHINESE CABBAGE VARIETY TRIAL:
TROPICAL PRIDE, EARLY TOP, JOI CHOI,
SALADEER, AND KURIHARA HYBRID VARIETIES

Ikenasio Sagaga and Don Vargo*

* Research Assistant and Soil Specialist, respectively, with the American Samoa Community College
Land Grant Program, P.O. Box 2609, Pago Pago, American Samoa 96799.

ABSTRACT

Five hybrid Chinese cabbage varieties currently recommended for American Samoa were compared for yield and for insect and disease resistance during the rainy season. No variety outperformed the others in any category of comparison. Insect damage was particularly great in a block harvested 6 days after the others. But this block, unlike the others, was mulched with fresh green manure 21 days before harvesting, confounding any conclusion. Insect pests are the greatest obstacle to Chinese cabbage production in American Samoa.

Chinese cabbage, or celery cabbage, is the name for a wide variety of "greens" of the genus Brassica that are quite different in character. All are cool-weather crops and bolt to seed during long-day periods (Doty, 1980). But several heat-tolerant varieties have been developed for the tropics, allowing Chinese cabbage to have become an important cash crop in Samoa grown for the local market.

To determine if any of the five F-1 hybrid varieties currently recommended and sold by the American Samoa Community College Land Grant Program is superior to the others, this study was undertaken during the beginning of the rainy season, the austral spring, when increasing temperature and humidity, and relatively longer day-lengths, place great constraints on growing Chinese cabbage in the territory.

METHODS AND MATERIALS

Seeds of three Chinese cabbage varieties--Tropical Pride, Early Top, and Joi Choi--from Sakata Seed Corp., 1-7, Nagata Higashi 3-chrome, Minami-ku, Yokohama, Japan 232, and two--Saladeer and Kurihara--from Takii Seed Company, 301 Natividad Road, Salinas, CA 93906, were planted in Jiffy Mix-filled peat pots 24-SEP-90, reared in a greenhouse, and transplanted 16-OCT to a typic dystrandept soil, Pavaiai series, prepared in beds as suggested (Opena and Lo, 1980). A soluble 10-52-8 fertilizer (7.5 g L^{-1} , 250 ml) was applied to each plant during transplanting.

A Randomized Complete Block Design with 3 replications was used to evaluate yields and susceptibilities to insect and disease damage.

DCPA (Dacthal W-75) preemergence herbicide was sprayed over the transplants on 29- and 30-OCT, following hand weeding, at a rate of 19 g L⁻¹ to control grasses, and a mulch of freshly cut sunnhemp (Crotolaria juneca) and cardboard was applied, because of limited supply, only to block 3 on 06-NOV. Dipel 4L (Bacillus thuringiensis, var. kurstaki) was applied at the rate of 1.75 ml L⁻¹ on 14-NOV for caterpillar control.

Blocks 1 and 2 were harvested 21-NOV (36 days after transplanting) and Block 3 on 27-NOV (42 days) by cutting the roots at soil level and weighing each plant to the nearest 0.05 kg on a top loading spring balance of 10 kg capacity. Insect damage was assessed for each plant using a Likert-type scale from 0 (no damage) to 5 (severe damage), and the number of missing or rotting plants in each plot of 22 plants was recorded.

Rainfall and temperature measurements were made on site using a Tru-Check rain gauge (150-mm capacity, read each weekday at 8 am) and a Belfort Instrument continuously recording temperature apparatus. Statistical analyzes were performed using the computer program MSUSTAT (Lund, 1988).

RESULTS AND DISCUSSION

Fig. 1 and table 1 show the average yields of each variety by block. There are no significant differences in yields at the 5%

level. Likewise, no significant differences exist for susceptibility to insect damage (Fig. 2, table 2), principally larvae of the diamondback moth, Plutella xylostella, and the lesser cabbage moth, Crocidolomia binotalis, or for losses due to rot (Fig. 3, table 3).

Insect damage in block 3 was much greater than in blocks 1 and 2. Whether this was due to the sunnhemp mulch, which attracted flies and may have attracted moths, or to being in the field 6 days longer, or both, is uncertain.

Effective control of caterpillar pests with B. thuringiensis was inhibited by frequent and sometimes heavy rains that washed the bacteria from the Chinese cabbage (Fig. 4). Uncertainty of weather also thwarted reliance on a regular spraying schedule

CONCLUSIONS

The five hybrid Chinese cabbage varieties performed equally well in American Samoa during the beginning of the rainy season, when caterpillar pest control is difficult and susceptibility to fungal infection is increased. Insect pests remain a year-round threat, and efforts to reduce vulnerability to attack, using input, environmentally sound methods, will be a major thrust of future research. Also, attention will be given to alternative crops such as lettuce, Lactuca sativa, which is not affected by the diamondback moth (McCalley, et al., 1985) or virtually any other insect pest in Samoa (Swan, 1974

ACKNOWLEDGEMENT

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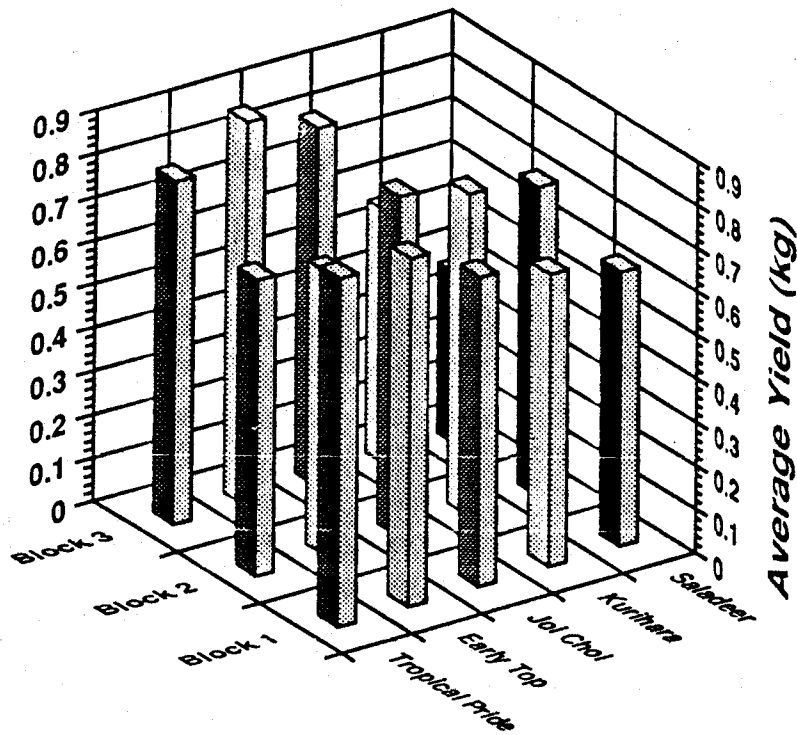


Fig. 1. Average Chinese cabbage yields (kg) of each 22-plant plot. Data from Table 1.

Table 1. Average Chinese cabbage yields (kg) of each 22-plant plot. Missing and rotting plants were omitted in the averaging.

Block	V A R I E T Y				
	<u>Tropical Pride</u>	<u>Early Top</u>	<u>Joi Choi</u>	<u>Kurihara</u>	<u>Saladeer</u>
1	0.80	0.80	0.71	0.67	0.63
2	0.68	0.65	0.78	0.74	0.71
3	0.79	0.88	0.82	0.58	0.39

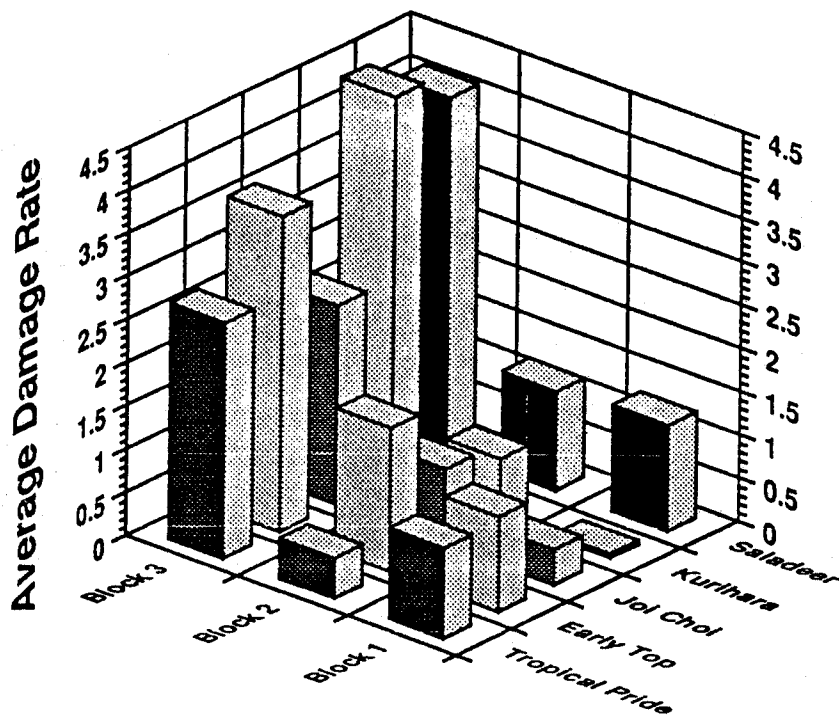


Fig. 2. Average Chinese cabbage susceptibility to caterpillar damage. Data from Table 2.

Table 2. Average Chinese cabbage susceptibility to caterpillar damage. Individual plants were rated from 0 (no damage) to 5 (severe damage). Missing and rotting plants were omitted in the averaging.

Block	V A R I E T Y				
	Tropical Pride	Early Top	Joi Choi	Kurihara	Saladeer
1	1.1	1.1	0.4	0.1	1.2
2	0.5	1.6	0.9	0.7	1.1
3	2.7	3.6	2.3	4.4	4.1

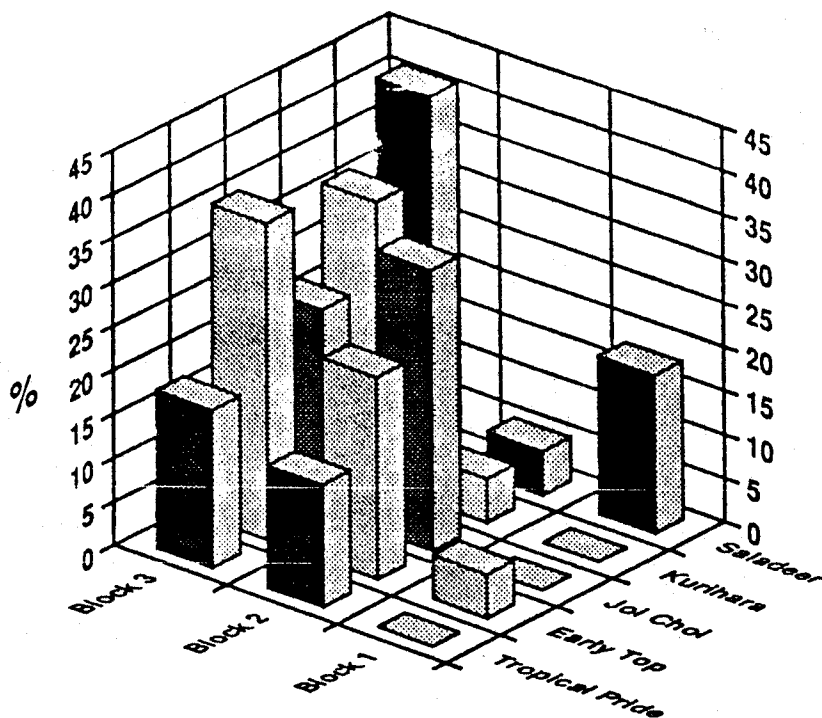


Fig. 3. Percent of Chinese cabbage plants missing or rotting in each 22-plant plot. Data from Table 3.

Table 3. Percent of Chinese cabbage plants missing or rotting in each 22-plant plot.

Block	V A R I E T Y				
	Tropical Pride	Early Top	Joi Choi	Kurihara	Saladeer
1	0	5	0	0	18
2	14	23	32	5	5
3	18	36	23	32	41

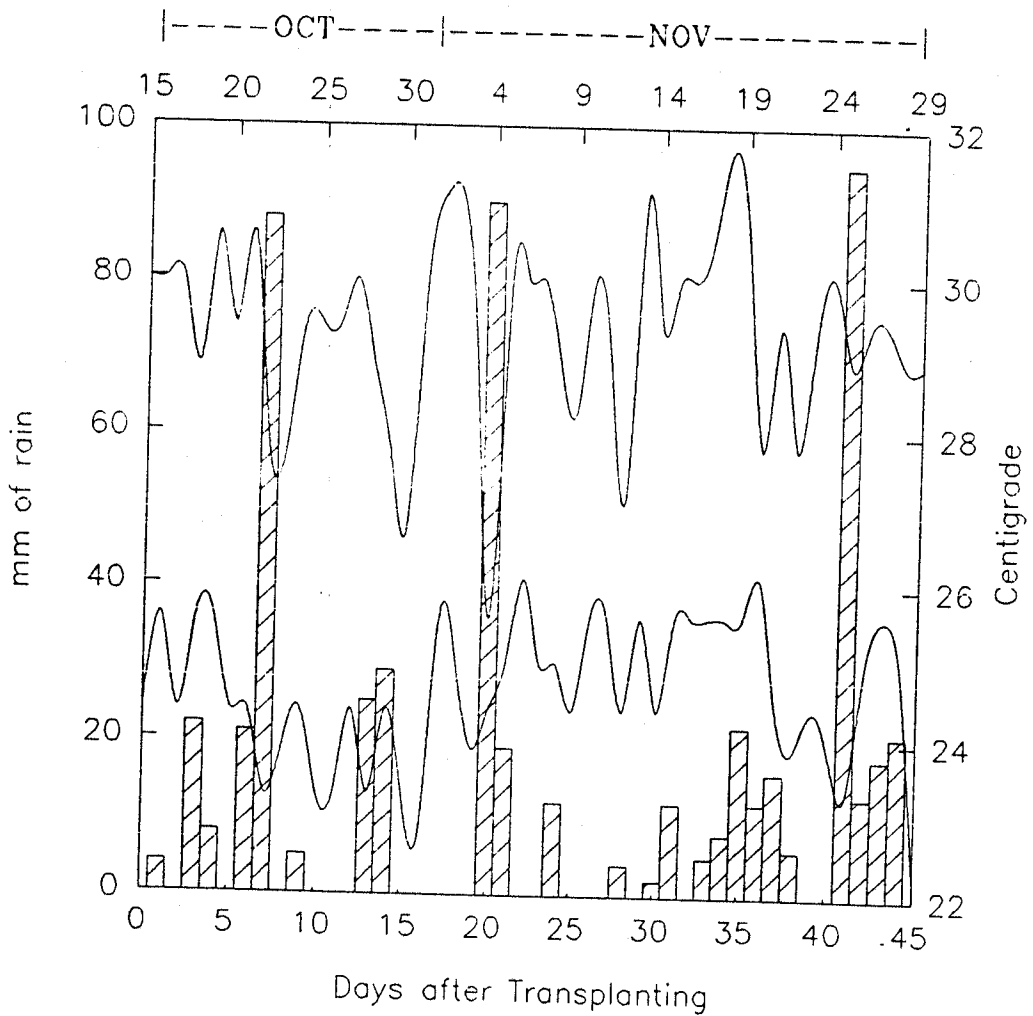


Fig. 4. Daily rainfall (bars), plus daily high and low temperatures (lines) during the Chinese cabbage variety field trial, 16-OCT-90 through 27-NOV-90. Total rain for this period was 518 mm.