

BUSH SNAP BEANS . . .

varietal evaluations and timing for mechanical harvest

Yield of pod sizes 1 through 4, expressed in terms of percentage of total yield, appears to be a practical measure of maturity for GV 50, Blue Lake 274, and Salem; but a different standard is required for Green Isle. For all four varieties in this trial, however, yield of pod sizes 1 through 4, expressed in terms of percentage of total yield, had a straight-line relationship, suggesting that field sampling for two or three days several days ahead of harvest time can be used to predict when a desired maturity (expressed in terms of percentage of pod sizes 1 through 4) will be reached.

R. A. BRENDLER

THE BUSH SNAP BEAN grown for freezing or canning is comparatively new to mechanical harvesting and has new cultural and harvesting problems. There is a brief 6- to 10-day period when the beans are suitable for mechanical harvesting. Like many other vegetables, they are harvested when they are growing rapidly and when yield and quality are changing appreciably from day to day. The rate at which yield goes up and quality goes down is different for each variety; so a thorough comparison of varieties

requires that yield and quality samples be taken from a trial over a period of several consecutive days. Such information aids in the understanding of what happens to a bush snap bean field as pods mature and suggests field-sampling techniques to be used to predict the best day to harvest.

In 1968, a variety trial of four varieties, each replicated four times, was conducted in cooperation with Richard and James Naumann in a Naumann Ranch Company field southeast of Oxnard.

As harvest approached, samples of all four replications of each variety were taken daily. For each variety, sampling began when the weight of pods graded (by size) from 1 through 4 was estimated at a little over 50 per cent of the total weight of the pods. Each sample consisted of a 10-ft section of row. The plants were pulled up, and the pods were taken off by hand and put through a mechanical grader which separated them into three size groups: sizes 1 through 4 (the smallest), sizes 5 and 6, and size 7. Size 7 pods, the largest, are of little value for freezing or processing. The pods in each class were weighed and counted and the averages of four replications were used to relate yields and percentages of pod classes with day of harvest.

Valid yield comparisons of bush snap bean varieties for mechanical harvesting

require that samples of each variety be taken several times at intervals of 1 or 2 days. The trial covered the period in which the four varieties were considered suitable for mechanical harvesting. During this period, yields of pod sizes 1 through 6 increased at steady rates of 704 lbs per acre per day for Galatin Valley 50 (GV 50), 524 lbs per acre per day for Salem, and 367 lbs per acre per day for Green Isle. Yield increases of pod sizes 1 through 6 for Blue Lake 274 exceeded 1,000 lbs per acre per day at a time when about 50 per cent of the pods were size 1 through 4; by the time the proportion of sizes 1 through 4 had fallen to 25 per cent, the daily yield increase had almost stopped.

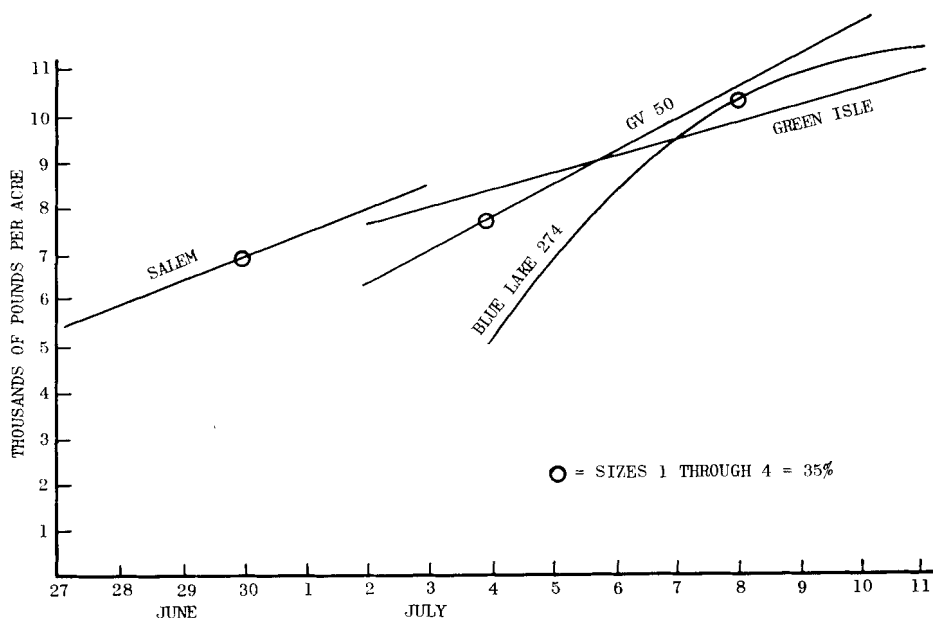
For Blue Lake 274, GV 50, and Salem, the peak yield of sizes 1 through 4 was reached at about the same time yields of sizes 1 through 4 and sizes 5 and 6 were equal. From then on, yields of sizes 1 through 4 decreased at a rate of 385 lbs per day for Blue Lake 274, 199 lbs per day for GV 50, and 198 lbs per day for Salem. The yield of sizes 1 through 4 for Green Isle remained almost constant throughout the 10-day harvest period.

The proportion of total yield consisting of sizes 1 through 4 decreased at rates of 7.4 per cent per day for Blue Lake 274, 4.9 per cent per day for GV 50, 6.6 per cent per day for Salem, and 2.5 per cent per day for Green Isle.

By the time the yield of pod sizes 1 through 4 (in each variety) had fallen to 35 per cent, Blue Lake 274 yielded 10,400 lbs per acre, GV 50 yielded 7,800 lbs per acre, and Salem yielded 6,900 lbs per acre. The yield of Green Isle cannot be compared on this basis because over-maturity was reached before the proportion of sizes 1 through 4 had fallen to 35 per cent. Yields of pod sizes 1 through 6 were about equal for Green Isle and Blue Lake 274 when the proportion of sizes 1 through 4 in Green Isle was 60 per cent, and the proportion of sizes 1 through 4 in Blue Lake 274 was 35 per cent.

In all varieties in this trial there was a high negative correlation of yields of pod sizes 1 through 6 with the percentage of pod sizes 1 through 4. The increase in yields of pod sizes 1 through 6 for each percentage of decrease of pod sizes 1

CORRELATIONS OF BUSH SNAP BEAN YIELDS OF SIZES 1 to 6 WITH DATE OF HARVEST

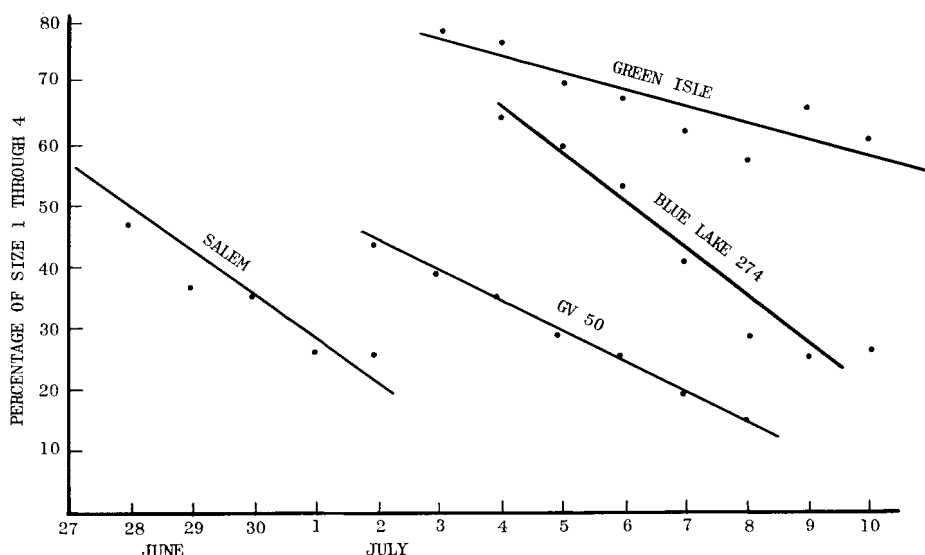


through 4 was 133 lbs per acre for Blue Lake 274, 154 lbs per acre for GV 50, 74 lbs per acre for Salem, and 128 lbs per acre for Green Isle.

In all four varieties there was a high correlation of pod size (in terms of pounds per 100 pods) with date of harvest. Pod size in terms of pounds per 100 pods increased at the rate of .073 lb for Blue Lake 274, .057 lb for GV 50, 0.73 lb for Salem, and .013 lb for Green Isle.

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CORRELATIONS OF BUSH SNAP BEAN PERCENTAGE OF SIZES 1 to 4 WITH DATE OF HARVEST



ACCELERATING tomato fruit maturity WITH ETHREL

SHUICHI IWAHORI • JAMES M. LYONS

THE NEW GROWTH REGULATOR, Ethrel (2-chloroethyl phosphonic acid), is similar in action to ethylene in its effects on various plant processes: it accelerates post-harvest ripening of tomato, banana, and honeydew melon fruits; it induces flowering in pineapple plants; it causes female flower differentiation in cucumber plants; and it acts as a thinning agent by accelerating abscission of flowers and young fruit in certain trees and by loosening fruit at harvest to aid mechanical harvesting. These experiments were initiated to examine the effects of Ethrel on growth and maturation of tomato fruit

on the vine under both greenhouse and field conditions.

Greenhouse trials

Of a group of tomato plants (cv. VF 480) grown in the greenhouse, each flower on the first to third clusters was tagged at anthesis. Ethrel at 500 ppm was sprayed on each fruit with a small hand sprayer. The chronological age of the fruit at treatment time varied from 15 to 35 days after anthesis. The date of the first appearance of red color (breaker) was recorded and, thereafter, ripening of fruit was determined daily as follows:

(1) breaker; (2) up to 25 per cent pink; (3) 25 to 50 per cent pink; (4) 50 to 75 per cent pink; (5) full red color, still firm; and (6) red and soft.

Maturation of tomato fruit treated with 500 ppm Ethrel was accelerated by seven days, while fruit weight remained the same as for the control fruit (graph 1). The treated fruit reached the breaker stage 39 days after anthesis, while the control fruit reached the same stage in 46 days. While maturation of the fruit was accelerated markedly by the treatment, the ripening process on the vine, as evidenced by color change, was only slightly affected.

Thus, Ethrel-treated fruit reached full red color (or index 5) four days after the breaker stage, and the control fruit in five days. The age of the fruit at time of treatment had no effect on the number of days they took to mature. In another trial, Ethrel at 250 ppm sprayed on individual fruit 14 days after anthesis or when they

EFFECTS OF ETHREL ON YIELD OF FIELD-GROWN TOMATO FRUIT

Treatment	Yield per plant		Number of fruit		Early yield per plant		Early number of fruit per plant		Average fruit weight
	lb		Av. no.		lb		Av. no.		
Control	8.36	(1.52)*	28.1	(6.5)*	0.93		3.0		4.56
250 ppm Ethrel	13.96	(0.90)	53.8	(3.7)	6.00		44.3		4.13
1000 ppm Ethrel	8.27	(1.61)	36.1	(7.5)	3.40		27.0		3.62

* Value in parentheses is for green fruit picked at the end of experiment (Sept. 19). Early yield harvested by Aug. 26.