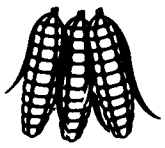

Seed Size Effects

ON HYBRID SWEET CORN IN COACHELLA VALLEY

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Seed size of hybrid sweet corn can affect total percentage of germination, and clearly affects the size of young plants, under winter planting conditions in the Coachella Valley. It can also affect the percentages of ear shoots which silk early and the number of ears ready for market at first pick. Experiments conducted with December and January plantings in 1958, 1959 and 1960 indicate that small seed should be avoided. Possible advantages in planting re-selected large seed are still uncertain, particularly when close planting, followed by thinning, is practiced.

HYBRID SWEET CORN seed of any one strain, when carefully produced, is genetically all alike. That is, the basic characters of any one plant are essentially identical to those of the others. However, size of embryo and the quantity of reserve food stored in a seed often influence early growth of the resulting plant.

Sweet corn planted in Coachella Valley in December and January—for the spring market—is subjected to cool soil temperatures resulting in slow germination and early growth. To test the possibility that large seed size might speed early growth in seedlings, commercial hybrid seed from bulk lots was sorted into large, medium, and small size. Average seed weights were 0.24 gm, 0.18 gm, and 0.14 gm. These three seed size groups, together with unsorted seed, were planted in replicated 2-row, 50-foot plots, at two locations in 1958, one location in 1959, and two in 1960. Seeds were planted at 6-inch spacing and seedlings were thinned to 12 inches after about six weeks.

Total germination

Total germination was somewhat lower in plots of the small seed than in those of the large seed in four out of five trials. No difference was observed in the 1959 trial under favorable early growing conditions. Large, medium, and unsorted seed showed little difference in total germination in any year. Clear differences appeared in the percentages of large plants from the different seed sizes at about four to five weeks after planting, as shown in the table.

Except for trial 2 in 1960, the percentages of large plants were significantly lower from small and from unsorted seed than from large seed. In three trials this percentage was also significantly lower from medium seed. Cold, rainy weather and a high incidence of seed damage from soil fungi during trial 2 in 1960 caused a slow emergence and poor total germination. Under these conditions, differences in plant size among surviving seedlings were not significant.

Seed grades

In 1960, two separate grades—"flat" and "large flat"—of the same strain of hybrid seed were tested by size groups. Seed size averaged from 8 to 17 per cent heavier in the size group from the large flat than from the flat grade. One of each pair of rows in each replication was planted with a size class from the flat grade, and the other with the comparable large flat size class. Percentages of large plants before thinning were similar for the two grades, and are not separated in the table.

PERCENTAGES OF LARGE PLANTS BEFORE THINNING, IN CORN SEED SIZE TRIALS IN COACHELLA VALLEY.

Seed size class	1958		1959	1960	
	Trial 1	Trial 2	Trial 1	Trial 1	Trial 2
1-large	10	29	81	30	24
2-medium	3**	12**	69	14**	22
3-small	1**	5**	42**	8**	20
4-unsorted ...	3**	14**	67**	14**	19

** Starred percentages are significantly lower than the percentage from the large seed size in any one trial.

At the time of first pick, 40 to 45 consecutive top ears per plot were classified for fresh market maturity. Small seed produced significantly less ears ready at first pick than did large seed in all trials except for trial 2 in 1960. Plots from medium and unsorted seed showed a trend in the same direction as shown in table below. Other statistical tests indidated that the *average* maturity dates of the plots were less affected by seed size than were the percentages of early ears produced.

Each seed size class from the large flat grade produced significantly more ears

PERCENTAGES OF EARS READY FOR MARKET AT FIRST PICK IN CORN SEED SIZE TRIALS.

Seed size class	1958		1959	1960			
	Trial 1	Trial 2	Trial 1	Trial 1		Trial 2	
				Flat	Large Flat	Flat	Lg flat
1-large	61	94	48	54	83	34	48
2-medium .	51	..	..	42	63	34	49
3-small ...	44**	71**	19**	31**	44**	28	51
4-unsorted .	58	..	48	46	58**	33	49

** Starred percentages are significantly lower than the percentage from the compared large seed size in any one trial.

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ready at first pick than did the comparable class from the flat grade in the 1960 trials. In trial 2 this difference occurred despite the irregular stand which had resulted from poor germination conditions. No other differences were detected in this trial.

Silking dates were also recorded for all plants in 1960. Earliness of silking was closely related to earliness of ear maturity. This should be expected, since silking occurs only 15 to 18 days before first pick in these winter plantings.

Total yield of marketable top ears was calculated two ways including and excluding late maturing ears (those which matured six days or more after first pick). When late ears were included, there was little difference in yield among the seed size classes. When late ears were excluded, the small seed usually produced the fewest marketable ears.

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Temperature and *Olive Yields*

DILLON S. BROWN · R. C. CAMPBELL · WALLACE R. SCHREADER

Years with January mean temperatures approaching the 50°F level are likely to be years of poor olive production unless the temperatures in the immediate post-January period are cool enough for flower bud development. Intermediate yields can be expected in years with only moderately low January temperatures and moderate to high temperatures in February and early March. Highest olive yields are most likely when both January and February temperatures are cool. In Tehama County, where in most years the January temperatures are cold enough to favor some flower bud initiation in olives, the temperatures of February and early March are also critical in relation to the number of flowers formed and the ultimate yield.

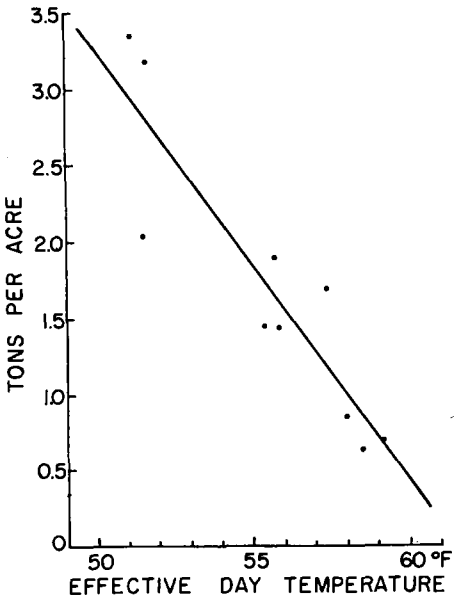
OLIVE PRODUCTION is influenced by climatic conditions, particularly temperatures, throughout the season. Winter temperatures influence the formation of flowers and the number of flower clusters. Temperatures at bloom affect pollination and fruit setting, and later the development of the fruit itself.

Olive yields in Tehama County are frequently low and may vary widely from year to year. Since 1951, the average yield in tons per acre has varied from 0.64 to 3.34. To test for a possible relation of temperatures to this variability in yield, the average yield per acre of olives in Tehama County was correlated with temperatures for different periods during the winter and spring. Temperature records were obtained from U.C. Department of Pomology thermograph stations at Corning and Red Bluff.

Correlations

The best correlations of yield and temperature were for the interval of February 9 through March 8—using the average maximum temperature, the effective day temperature and the number of hours over 60°F. The effective day temperature was calculated by subtracting one-fourth of the difference between the average maximum and minimum temperatures from the average maximum. Minimum temperatures or the number of hours at temperatures less than 60° during the

Relation of effective day temperature for the period February 9 to March 8 to olive yields in Tehama County.



Relation of maximum temperature for the period February 9 to March 8 to olive yields in Tehama County.