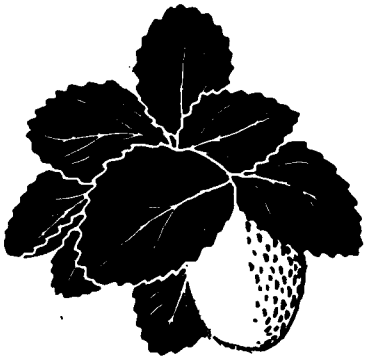


VICTOR VOTH • R. S. BRINGHURST • O. R. LUNT

PREPLANT FERTILIZERS on Winter Planted Strawberries

WINTER PLANTINGS of strawberries account for about one half of the annual acreage in southern California. Early production (March and April) is as important as total production in this area. Both earliness and total production are closely associated with the growth of plants during the short days of the winter.

Growing temperatures and the amount of chilling received before transplanting greatly influence the growth of strawberry plants during the critical short winter days. Both of these factors are subject to modification. Clear polyethylene bed covers applied shortly after planting time increase the soil temperature, and plants originating in high elevation nurseries receive chilling earlier than plants from low elevation nurseries and consequently grow more actively during the short days.

A constant supply of available nitrogen in the upper few inches of soil is needed for winter-planted strawberry plants to grow and perform satisfactorily. The nitrogen fertilization experiments reported here were designed to investigate materials that might be placed in the bed before planting to give the plants a continuous supply of nitrogen through the growing season. This is important because fertilizer materials can not be applied easily after the polyethylene mulch is in place. Polyethylene is now used on almost all plantings in southern California. On winter plantings, polyethylene bed covers should be applied as soon after transplanting as possible.

1962 treatments

During 1962, fertilizer treatments compared with unfertilized check plots included: urea formaldehyde, ammonium sulphate, bloodmeal, resin coated, and metal ammonium phosphates. All fertilizers were placed 3 inches deep, in three bands, in the bed before planting. The rate for all treatments, except the check, was 150 pounds actual nitrogen per acre. Experiments completed at the station in 1958–59 (data unpublished) have demonstrated a nitrogen response as well as a *lack* of response to either phosphorus or potassium. Published data for 1959–60 have shown 150 pounds of actual nitrogen per acre adequate for maximum production at the site.

Lassen plants

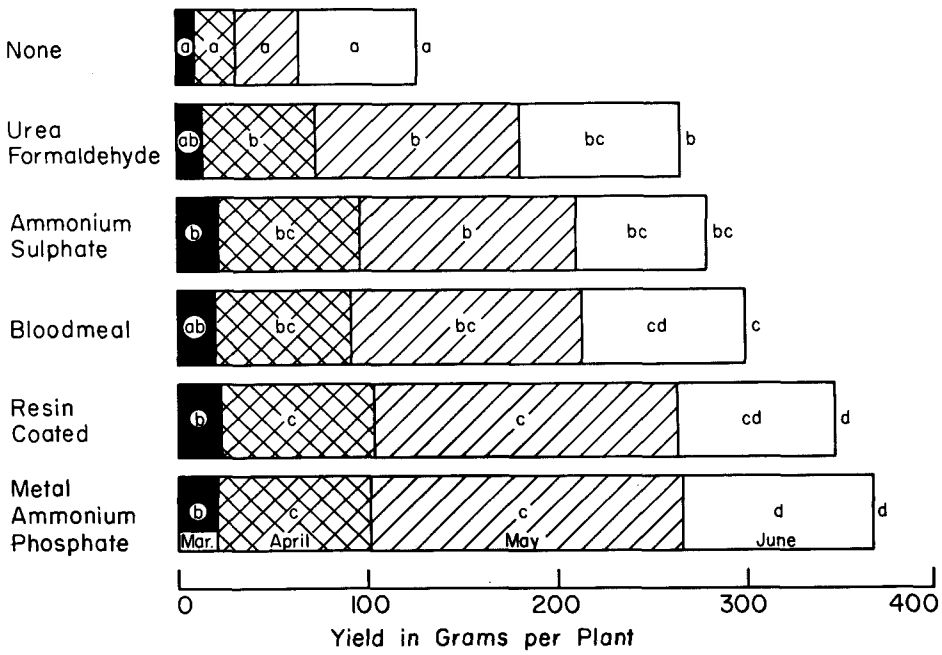
Plants of the Lassen variety were grown under the double, row-raised, bed-hill system with 42-inch beds and 12 × 12-inch plant spacing on the beds. This gives about 25,000 plants per acre.

Plants originating in high elevation nurseries were compared with those from low elevation nurseries in the experiment, and early-applied polyethylene (planting time) was compared with late polyethylene (March 1) in a split-plot design. There was no interaction, however, between fertilizer treatments, nursery sources or polyethylene treatments so the results have been combined in this presentation. Fertilizer treatments were thus replicated 12 times.

Controlled availability fertilizer treatments (metal ammonium phosphate and resin coated) consistently outyielded the other fertilizer treatments through four months of harvest. While for a given month, the yield from these two treatments was not significantly greater than that from bloodmeal, the cumulative total was significantly greater, due primarily to the higher yields in May and to a lesser extent to those in June. Similar results

1962 YIELD OF WINTER-PLANTED LASSEN STRAWBERRIES, BY MONTHS, AT SANTA ANA

Differences for any month (or total yields at right) are significant at the 1% level if they have no letter in common. 100 grams per plant = about 2.75 tons per acre.



were obtained for average fruit size and general appearance, two factors that tend to be correlated. The lasting effect of the metal ammonium phosphates, suggested by the yield data, is clearly illustrated by the stolon production data. Stolons do not develop on winter plantings of the Lassen variety until after fruit production is terminated. The plots fertilized by metal ammonium phosphates produced a significantly greater number of stolons than any other treatment.

Resin coated or metal ammonium phosphate preparations might be used effectively as single-application, preplant fertilizers, and appear to have some intrinsic advantages over conventional soluble fertilizers in this type of strawberry culture. Bloodmeal is a relatively fast acting organic fertilizer while urea-formaldehyde is slow acting. At higher rates, these materials might have performed better. The amount of long-lasting fertilizer required for different soil types would have to be determined for each location. The soil involved in this experiment requires considerable nitrogen fertilization, as evidenced by the low yield from the unfertilized check.

Average strawberry fruit size in grams/fruit, cumulative appearance scores (highest number is best score), and average stolon production in stolons/plant for the various preplant fertilizers. Differences are significant at the 1% level if they have no letter in common.

FERTILIZER	FRUIT SIZE	APPEARANCE SCORE	STOLONS
Na fertilizer	7.8 a	0.6 a	24.0 a
Urea formaldehyde	9.2 b	4.0 b	32.4 a
Ammonium sulphate	9.4 bc	4.7 bc	26.5 a
Bloodmeal	9.4 bc	5.1 bc	37.2 a
Resin coated	9.6 bc	4.7 bc	39.7 a
Metal ammonium phosphate	10.0 c	6.7 c	63.2 b

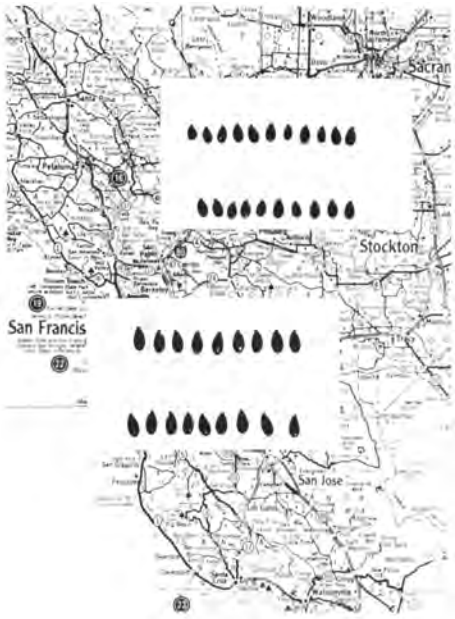
Victor Voth is Research Specialist and R. S. Bringhurst is Professor, Department of Pomology, University of California, Davis. O. R. Lunt is Professor, Department of Irrigation and Soils, U.C., Los Angeles. This is a report of project 1386.

ENVIRONMENTAL INFLUENCE ON SEED AND OIL CHARACTERISTICS OF FLAX

Tables included here are a part of the article by D. M. Yermanos, Assistant Agronomist, Agricultural Experiment Station, University of California, Riverside, printed in the August issue of California Agriculture. A complete corrected reprint of the article including the tables is available at no charge by writing to California Agriculture, University of California, 207 University Hall, 2200 University Ave., Berkeley 4, California.

TABLE 1. 1000-SEED WEIGHT OF FLAX VARIETIES GROWN IN DIFFERENT LOCATIONS IN CALIFORNIA (GRAMS)

Variety	1960	Year and Location 1961				1962
	U.C. Davis	U.C. Davis	W.S. Field Station	San Mateo Co.	Imp. V. Field Station	U.C. Riverside
New River	...	6.13	5.99	7.17	6.01	6.23
Imperial	...	5.70	5.63	6.32	5.45	5.28
Redwood	5.77	5.75	4.37	6.31	...	...
B-5128	6.00	6.02	...	6.79	...	5.58
Argentine	...	5.74	5.19	8.03	...	6.66
Bolley	5.58	5.34	4.31	6.34	...	5.62
Arny	5.33	5.13	4.48	5.93	...	5.27
Punjab 47	6.66	6.71	6.36	...	...	6.45
Punjab 53	6.02	...	5.46	...	5.51	4.92
Dakota	6.14	6.11	4.93	...	...	4.88
Viking	4.79	5.90	4.79	...	...	6.36
Bison	5.26	5.34	...	6.14	...	5.27
Linda	7.05	6.69	...	7.62	...	7.40
Raja	5.74	5.69	...	...	...	3.91



Different environments may cause striking differences in flax seed size, as shown in this comparison of the Indian variety Cawnpore, grown at University of California, Davis, and at Pescadero.

TABLE 2. PERCENT OIL CONTENT OF THE SEED OF FLAX VARIETIES GROWN IN DIFFERENT LOCATIONS IN CALIFORNIA

Variety	1960	Year and Location 1961				1962
	U.C. Davis	U.C. Davis	W.S. Field Station	San Matea Co.	Imp. V. Field Station	U.C. Riverside
New River	...	42.5	42.7	46.1	44.3	38.8
Imperial	...	41.5	41.2	45.2	40.8	39.2
Redwood	41.0	38.9	39.0	44.9	...	39.4
B-5128	42.8	39.7	...	45.1	...	39.6
Argentine	...	42.6	39.1	46.0	...	39.9
Bolley	40.5	40.1	37.7	45.9	...	38.1
Arny	39.3	38.9	38.0	44.9	...	39.2
Punjab 47	42.1	41.4	42.7	...	40.5	...
Punjab 53	41.9	...	41.3	...	41.3	39.5
Dakota	41.2	40.3	39.8	42.5	...	39.5
Viking	...	41.6	39.8	47.3	...	39.4
Bison	38.2	38.5	...	45.5	...	38.8
Linda	41.0	40.9	...	45.4	...	39.2
Raja	38.4	39.1	...	...	...	38.1

TABLE 3. IODINE VALUE OF THE OIL OF FLAX VARIETIES GROWN IN DIFFERENT LOCATIONS IN CALIFORNIA

Variety	1960	Year and Lacation 1961				1962
	U.C. Davis	U.C. Davis	W.S. Field Station	San Matea Co.	Imp. V. Field Station	U.C. Riverside
New River	...	174	187	196	179	173
Imperial	...	178	190	194	179	181
Redwood	184	183	196	202	...	183
B-5128	182	182	...	196	...	188
Argentine	...	182	187	193	...	192
Bolley	188	186	192	198	...	188
Arny	186	185	196	199	...	183
Punjab 47	172	173	188	...	184	177
Punjab 53	184	...	196	...	190	188
Dakota	192	194	195	199	...	184
Viking	...	201	199	206	...	196
Bison	170	171	...	195	...	174
Linda	177	177	...	196	...	172
Raja	181	181	...	...	...	184