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STRAWBERRY NEWS BULLETIN

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Albino Fruit - A Preliminary Induction Experiment
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Albino fruit has been a very perplexing and often costly problem for some growers in recent years. The name for this malady was agreed upon by common consent because the skin color of ripe, affected fruit is almost white in highly susceptible varieties like Shasta. Albino fruit is not really marketable, fresh or frozen because of unacceptable appearance, flavor and general composition. The problem has been recognized for years but recently has reached the disaster level for individual growers in certain harvests.

The cause is unknown although it has been the topic of much speculation. As an approach to the cause, we completed an experiment with the 'Shasta' variety at our Salinas experimental substation in 1968-69. The design of the experiment was intended to induce differentials in levels of albinism based upon our interpretation of the circumstantial evidence available in 1968.

The treatments included: No fertilizer; high and low levels of nitrogen ($(\text{NH}_4)_2\text{SO}_4$) with and without manganese; high nitrogen with potassium and high nitrogen with potassium + manganese; and an approximation of general growers' practices in the area, 10-10-10 applied at a high nitrogen rate. In addition, heavy irrigation was compared with normal irrigation and normal plant spacing (14 inches) was compared with close spacing (7 inches). There were 5 replicates.

Total yield and the portion of the fruit that was albino were recorded at each harvest by weight. Data are presented for the normal irrigation and plant spacing only since they illustrate the main points that are appropriate to this brief presentation. Yield is expressed as grams of fruit per plant and average fruit size as grams per fruit in the following table:

Nutrient	1st 6 weeks		2nd 6 weeks		Total		
	Yield	% Albino	Yield	% Albino	Yield	% Albino	Size
Check	168 d*	0	79 c	1.3	247 c	0.5	12.6 b
Low N	243 bc	2.3	155 b	1.3	498 b	2.0	14.8 a
High N	383 a	8.5	216 a	5.5	599 a	7.2	15.7 a
Lo N + Mn	308 c	13.7	218 a	12.8	526 b	13.3	15.7 a
Hi N + Mn	331 bc	12.7	220 a	15.0	551 b	13.8	15.6 a
Hi N + K	349 ab	8.4	161 b	8.7	510 b	8.5	14.9 a
Hi N + Mn + K	293 c	32.2	214 a	33.6	507 b	32.8	15.3 a
10-10-10	370 ab	17.1	215 a	12.1	585 ab	15.0	16.3 a

* Any value in the same column is significantly different from any other value in that column if they do not share a common letter

There was a differential expression in the percentages of albinism under the conditions of this experiment. Low nitrogen alone induced low levels of albinism scarcely different from the check. High nitrogen alone induced over three times as much albinism as low nitrogen. With the addition of manganese high or low nitrogen induced about equal levels of albinism both higher than that for high nitrogen alone. The albino level for high nitrogen plus potassium was only slightly higher than that for high nitrogen alone but high
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nitrogen plus potassium plus manganese induced about 1/3 albinos, by far the highest. The 10-10-10 treatment also induced a high percentage of affected fruit.

The results of this experiment justify the provisional conclusion that nutritional imbalance, aggravated by imprudent fertilizer applications may be the chief cause of albino fruit. If the data are indicative of what is happening generally, excessive use of nitrogen should be avoided and mixed fertilizers should be used only when they are known to be needed. The studies will be continued.

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