

CALIFORNIA STRAWBERRY ADVISORY BOARD

UNDER AUTHORITY OF THE DIRECTOR OF AGRICULTURE, STATE OF CALIFORNIA

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STRAWBERRY NEWS BULLETIN

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Meristem Culture of California Strawberries

DAY NEUTRALS VS. SHORT DAY

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In 1974, the first day neutral strawberry selections from the University breeding program were meristem cultured. Prior to this, our experience was limited almost exclusively to the short day varietal types. We had observed that certain varieties were more difficult to meristem culture than others and this variability we now believe is a genetic characteristic of the variety, and possibly related its flowering response. Thus, we were particularly interested in a study allowing us to compare meristems of day neutral and short day varieties.

Early results for meristems cultured on July 1 indicated that the percentage success for two day neutrals, CN11 and CN14, was noticeable higher than for two short day selections, C4 and C12 (table 1). The experiment was repeated six weeks later on August 15, and again, success was far greater with the day neutral meristems.

Further work done with additional day neutral and short day selections showed that overall, 48% of day neutral and 34% of short day meristems grew into plantlets and that day neutral meristems grew into plantlets 1 month faster than the short day meristems (table 2). For both types, the size of the original meristem piece greatly affected the success of obtaining plantlets but had no measureable effect on how fast the meristem plantlets developed. Thus, day neutral meristems, initially 0.012 to 0.039 inches high grew into plantlets in the same number of days.

Extensive work completed on the most important California variety, Tioga, had shown a significant variation in success of meristem culture throughout the year, July and August being the ideal months for production of high percentages of plantlets. Preliminary data indicate that this may not be the case for the day neutrals (table 3). Based on the Tioga data, we have not cultured day neutral meristems during February-May.

In summary, the California day neutral strawberry selections are readily adaptable to meristem culture and are more easily handled than short day varieties. Not only do more day neutral meristems grow into plantlets but they grow also significantly faster. In addition, the fact that they may be meristemmed successfully any month of the year is a big advantage and allows for flexible culture scheduling, and more efficient use of laboratory and greenhouse facilities.

TABLE 1. Percentage of plantlets obtained when meristems from two day neutral and two short day selections were cultured on different dates.

Selection ^a	July 1		August 15	
	No. cut	% plantlets	No. cut	% plantlets
C4	50	8	25	20
C12	86	28	10	40
CN11	38	50	24	71
CN14	39	66	24	79

^aAll selections were heat treated at 100F for 3-4 weeks prior to excision and culturing of the meristems.

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TABLE 2. Summary of data on all day neutral and short day selections and varieties.¹

Size of meristem in inches	Day Neutrals			Short Day		
	No. of meristems cultured	% plantlets obtained	Days to planting out size	No. of meristems cultured	% plantlets obtained	Days to planting out size
up to 0.011	122	17.2	77	227	13.2	93
0.012	226	42.9 ² _a	67	535	27.1 _a	91
0.013-0.026	612	54.7 _b	66	1574	37.2 _b	94
0.027-0.039	96	57.3	67	214	44.4	97
	1056	48.1 _c	67	2550	33.6 _c	94

¹In most cases, the source plants were heat treated prior to meristem culture.

²Data followed by the same letter are significantly different to 1%.

TABLE 3. Monthly variation in percentage of meristem plantlets obtained from heat treated day neutrals and heat treated Tioga.

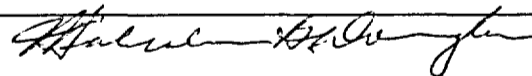
Month	Day Neutrals ¹		Tioga ²	
	No. cut	% plantlets	No. cut	% plantlets
Jan.	189	59	84	18
Feb.	---	---	106	1
Mar.	---	---	115	4
Apr.	---	---	103	5
May	---	---	94	12
June	297	55	111	25
July	199	28	92	35
Aug.	125	51	92	33
Sept.	137	37	116	20
Oct.	29	97	126	18
Nov.	72	43	---	---
Dec.	---	---	71	20

¹The data shown are combined results for 17 day neutral selections.

²Mullin, R. H. and Schlegel, D. E. 1975. Success of meristem culture varies throughout the year. Strawberry News Bulletin XXI (17).

ALL CALIFORNIA STRAWBERRY GROWERS
MARCH 30TH, 1977, 1:30 P.M.

25th Annual Strawberry Field Day, South Coast Field Station, 7601 Irvine Blvd., Santa Ana near El Toro Marine Base. Dr. Royce Bringham and Victor Voth to report on their latest findings and also, A. O. Paulus, Plant Pathologist, Dr. E. R. Oatman and Dr. J. A. Wyman, Entomologist. All growers are urgently requested to be present for a very interesting afternoon.



California Strawberry Advisory Board
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