

PROGRESS REPORT  
PROJECT 81-KB

**Project Name: Tree and Crop Research:  
Part A: Noninfectious Bud Failure;  
Part B: Breeding and Genetic Studies;  
Part C: Variety Evaluations**

I. Tree and Crop Research

1. Biochemical studies to determine possible "finger printing" systems for noninfectious bud-failure and other variants were made. (a) Several standard isozymes systems were used to examine differences among varieties. These included Peroxidase (PER), phosphoglucosomerase (PGI) and Leucineaminopeptidase (LAP).

Fifty-four varieties and selections could be divided into 6 groups with respect to combinations of PGI and LAP. However, variation within varieties, as for noninfectious bud-failure (BF) and Bull Mission Syndroms (BMS) were not detected by this method. (b) Studies on the nucleic acids of normal and affected BF plants are in progress. By graduate student Lou Fenton in cooperation with Dr. A. Kuniyuki (Department of Pomology) which should have more promise to detect and measure such differences biochemically.

At present these studies involve methodology such that no positive results can be reported.

2. Cells of normal and BF affected Nonpareil trees are being grown in sterile culture. Likewise excised shoots of almond of both types are growing in sterile culture.

A medium to support the continuous growth of cells from BF Nonpareil culture has been developed. Cells originally from "normal" almond have been less able to grow but have now been established. Earlier we have shown that tissue from the BF sources grew differently from that from "normal".

The seasonal pattern of bud failure was again followed this year based on visible evidence of necrosis in bud samples collected at particular times during summer and also by forcing buds on excised shoots. Results suggest that the proportion of affected buds produced during this season may be unusually high and more severe symptoms than normal might be expected to occur next spring. This pattern would follow from the unusually high temperatures occurring this year in the early part of the season.

3. Source clones of Nonpareil and Mission from Foundation Seed and Plant Materials are being tested for yield and presence of BF or BMS in RVT plots. Nine source clones of Nonpareil are under test as are 3 of Mission plus several others. Although some Nonpareil source clones had less yield in the Kern plot, there does not seem to be significant differences among Nonpareil and Mission source clones in yield based on overall information. None of the Nonpareil show symptoms of BF and none of the Mission show BMS. All of the Mission trees from this source clones produced typical hard shelled, characteristic Mission nuts with full production once they reach maturity.

## Part B. Breeding and Inheritance Studies

1. Several breeding studies are being conducted to test transmission of BF and various other characteristics. These include:
  - a. Transmission of BF from various  $F_1$  almond x peach crosses as compared to transmission from BF Nonpareil x almond (various crosses (1978 crosses)).
  - b. Inheritance of reduced tree size, thin shell, precocity, and self fertility from almond species hybrids (1980 crosses).
  - c. Inheritance of (a) genetic dwarf peach (1979 crosses) x almond and (b) genetic dwarf almond in peach crosses (1978 crosses).
2. Preliminary analysis of results show
  - a. BF has appeared in some additional almond x peach crosses including crosses with Carmel and several numbered selections. None have appeared so far in the progeny of almond x genetic dwarf peach even though BF Nonpareil was the other parent.
  - b. BF offspring appeared in some almond x almond progeny but at a very low rate as compared to some cross with peach. Similar results as earlier studies.
  - c. Some plants resulting from interspecific hybridization with other almond species fruited in 1981 but none of the nut samples have been evaluated yet. The large number of offspring from the 1980 crosses should be fruiting in 1982.
  - d. Some genetic dwarfed seedlings types from almond x almond crosses appeared in the offspring (1978 crosses) but nuts have not yet been examined.
3. New crosses in spring 1981 have included production of the  $F_2$  progeny from selfed almond x peach  $F_1$  individuals. Almond parents, were with and without BF. The purpose is to test the possibility of eliminating BF through an almond x peach genetic screen. Seeds were planted in the field in November.
4. Many of the (genetic dwarf peach x almond)  $F_1$  hybrids (1979 crosses) produced fruit this year. Open pollinated seeds from individual trees were collected in July and germinated this fall. Somewhat less than half of these seedlings show initial dwarfism in the small seedling stage such that we have about 500 dwarfed plants to grow out. An equal or larger number of normal sized progeny also has resulted. The purpose is to determine segregation patterns of normal and BF, peach and almond growth and nut characters and normal size and dwarf size.

Part C. Variety Evaluation

1. Four of the RVT plots were harvested in 1981 and data from 3 of the plots is included in this report. Harvest was also made from the Manteca plot (planted 1978) for the first time this year but analysis of results is not completed. The Fresno plot was planted in the spring. In addition, more varieties were added to the Kern plot. Yield data is presented without analysis at this time.
2. Three new almond varieties are being introduced this winter and will be available next year for June budding. These include the following:

Selection 5-58. PADRE. This variety blooms with Mission and matures before Mission. The tree and nut both resemble Mission. Kernel size tends to be slightly smaller than Mission. Grows very well on Marianna 2624 plum rootstock.

Selection 5A-3. SOLANO. This variety blooms with Nonpareil and matures slightly after Nonpareil. Nut is soft shelled, better sealed than Nonpareil but not resistant to NOW. Kernel high quality, Nonpareil type.

Selection 5A-20. SONORA. This variety blooms before Nonpareil and matures just after Nonpareil. Nut is paper shelled and not well sealed (about with Nonpareil). Kernel high quality, large kernel type.

Personnel: Dr. D. Kester, Department of Pomology, UCD, Project Leader  
R. N. Asay, L. Liu, M. Aduib, Lou Fenton  
W. C. Micke (Cooperative Extension) UCD and various Farm  
Advisors, see data sheets.  
Contribution from Dr. A. Kuniyuki and Dr. P. Hansche is  
acknowledged.

(1981) CROP  
Kern RVT Plot  
McFarland, California  
1974 Planting

1981

| <u>Variety</u>   | <u># Nuts<br/>/Tree</u> | <u>Average<br/>Size<br/>#/oz.</u> | <u>lbs./<br/>Tree</u> | <u>Per Acre<br/>Yield(1)</u> | <u>Shelling<br/>%</u> | <u>%<br/>Sealed</u> | <u>%<br/>NOW</u> | <u>Full<br/>Bloom<br/>Date</u> |
|--|-------------------------|-----------------------------------|-----------------------|------------------------------|-----------------------|---------------------|------------------|--------------------------------|
| <b>A. Early Blooming Varieties - 1974 Planting</b>     |                         |                                   |                       |                              |                       |                     |                  |                                |
| 5A-20  | 11896                   | 24                                | 30.96                 | 2322                         | 70                    | 92                  | 4                | 2/19                           |
| Jordanolo  | 8362                    | 20                                | 26.14                 | 1961                         | 57                    | 76                  | 12               | 2/19                           |
| FPMS Jordanolo   | 6011                    | 20                                | 18.80                 | 1410                         | 57                    | 90                  | 18               | 2/19                           |
| Ne Plus Ultra  | 4988                    | 19.5                              | 15.95                 | 1196                         | 57                    | 96                  | 6                | 2/17                           |
| FPMS Ne Plus Ultra                                     | 4929                    | 21                                | 15.07                 | 1130                         | 54                    | 98                  | 0                | 2/17                           |
| Money Tree   | 3671                    | 19                                | 12.69                 | 952                          | 65                    | 40                  | 38               | 2/19                           |
| <b>B. Nonpareil Bloom: Pollinizers - 1974 Planting</b> |                         |                                   |                       |                              |                       |                     |                  |                                |
| Fritz  | 12327                   | 30                                | 25.68                 | 1926                         | 56                    | 98                  | 2                | 2/26                           |
| 5A-3   | 11896                   | 30                                | 24.76                 | 1857                         | 61                    | 94                  | 2                | 2/26                           |
| Harvey   | 11627                   | 29                                | 25.06                 | 1880                         | 67                    | 90                  | 6                | 3/2                            |
| Milow  | 10448                   | 34                                | 22.77                 | 1708                         | 65                    | 91                  | 7                | 2/23                           |
| Price  | 10404                   | 28                                | 23.29                 | 1747                         | 63                    | 94                  | 6                | 2/26                           |
| Carmel   | 9203                    | 27                                | 21.30                 | 1598                         | 58                    | 98                  | 2                | 2/26                           |
| Nonpareil (7 rows*)                                    | 8734                    | 25                                | 21.40                 | 1605                         | 60                    | 82                  | 3                | 2/26                           |
| K-13N  | 8489                    | 17.5                              | 19.38                 | 1453                         | 50                    | 88                  | 8                | 2/26                           |
| Merced   | 8447                    | 29                                | 18.21                 | 1366                         | 66                    | 100                 | 6                | 2/26                           |
| 23-122   | 8206                    | 26.5                              | 19.42                 | 1457                         | 57                    | 98                  | 2                | 2/26                           |
| 2-17   | 8157                    | 31.5                              | 16.18                 | 1213                         | 45                    | 98                  | 4                | 2/26                           |
| Norman   | 6287                    | 30.5                              | 12.82                 | 962                          | 65                    | 94                  | 0                | 2/28                           |
| 69-60  | 6041                    | 27                                | 13.99                 | 1049                         | 50                    | 98                  | 0                | 2/23                           |
| Vesta  | 5684                    | 26.5                              | 13.35                 | 1001                         | 54                    | 96                  | 0                | 2/26                           |
| Robson   | 4234                    | 22                                | 12.03                 | 902                          | 57                    | 96                  | 0                | 2/26                           |
| Granada  | 2737                    | 27.5                              | 6.21                  | 466                          | 57                    | 90                  | 4                | 2/24                           |
| Profuse  | 1686                    | 20                                | 5.23                  | 392                          | 56                    | 86                  | 2                | -                              |
| <b>C. Mission Bloom: Pollinizers</b>                   |                         |                                   |                       |                              |                       |                     |                  |                                |
| Butte  | 12265                   | 33                                | 23.22                 | 1742                         | 55                    | 98                  | 0                | 3/3                            |
| Thompson   | 11512                   | 25.5                              | 21.19                 | 1589                         | 63                    | 96                  | 4                | 3/2                            |
| Mission 3-6-1-65                                       | 11093                   | 29.5                              | 23.54                 | 1766                         | 46                    | 100                 | 0                | 3/1                            |
| Ruby   | 11061                   | 30.5                              | 22.69                 | 1702                         | 53                    | 98                  | 2                | 3/5                            |
| Carrion  | 10172                   | 26.5                              | 24.02                 | 1802                         | 54                    | 100                 | 0                | 3/2                            |
| CP 5-58 (1975 *)                                       | 9918                    | 32                                | 19.33                 | 1450                         | 54                    | 100                 | 0                | 3/2                            |
| 3-24E  | 9759                    | 39                                | 15.64                 | 1173                         | 55                    | 94                  | 4                | 3/9                            |
| Ripon  | 5701                    | 28                                | 12.72                 | 954                          | 45                    | 98                  | 2                | 3/9                            |
| <b>D. Nonpareil Source Clones</b>                      |                         |                                   |                       |                              |                       |                     |                  |                                |
| 3-8-5-72   | 13506                   | 27                                | 31.09                 | 2332                         | 62                    | 82                  | 6                |                                |
| 3-8-4-72   | 12214                   | 29.5                              | 25.87                 | 1940                         | 61                    | 86                  | 2                |                                |
| 3-8-2-70   | 10742                   | 26                                | 25.82                 | 1937                         | 60                    | 98                  | 6                |                                |
| 3-8-8-72   | 10414                   | 27                                | 24.10                 | 1808                         | 61                    | 82                  | 2                |                                |
| 3-8-6-70   | 10343                   | 24                                | 25.40                 | 1905                         | 68                    | 90                  | 6                |                                |
| 3-8-12-72  | 9424                    | 28                                | 21.05                 | 1579                         | 59                    | 76                  | 2                |                                |
| 3-8-11-72  | 7976                    | 26.5                              | 18.81                 | 1411                         | 61                    | 84                  | 4                |                                |
| 3-8-10-72  | 7203                    | 24                                | 18.82                 | 1412                         | 60                    | 78                  | 4                |                                |
| 3-8-9-72   | 4909                    | 23                                | 13.34                 | 1001                         | 59                    | 72                  | 6                |                                |

1981

| riety                           | # Nuts<br>/Tree | Average<br>Size<br>#/oz. | lbs./<br>Tree | Per Acre<br>Yield | Shelling<br>% | %<br>Sealed | %<br>NOW | Full<br>Bloom<br>Date |
|---------------------------------|-----------------|--------------------------|---------------|-------------------|---------------|-------------|----------|-----------------------|
| <u>E. Mission Source Clones</u> |                 |                          |               |                   |               |             |          |                       |
| <del>3-6-1-65</del>             | 11093           | 29.5                     | 23.54         | 1766              | 46            | 100         | 0        |                       |
| <del>3-6-2-67-2432</del>        | 9461            | 28                       | 21.12         | 1584              | 44            | 98          | 0        |                       |
| <del>3-6-1-65</del>             | 9348            | 30                       | 19.90         | 1493              | 45            | 98          | 0        |                       |
| <del>3-6-3-67</del>             | 9259            | 28.5                     | 20.44         | 1533              | 46            | 100         | 0        |                       |
| Commercial (3 rows)             | 9138            | 28.8                     | 19.83         | 1488              | 46            | 100         | 0        |                       |
| Commercial                      | 8790            | 27.5                     | 20.01         | 1501              | 46            | 100         | 0        |                       |

F. Nonpareil Bloom: Pollinizers - 1976 Planting

|           |      |      |       |      |    |     |    |
|-----------|------|------|-------|------|----|-----|----|
| Jeffries  | 9308 | 26   | 22.31 | 1673 | 64 | 86  | 2  |
| 7-10      | 8876 | 27   | 20.96 | 1572 | 64 | 76  | 8  |
| Nonpareil | 8789 | 24   | 23.09 | 1732 | 64 | 77  | 3  |
| 1-46      | 6648 | 26.5 | 15.66 | 1175 | 52 | 92  | 4  |
| 1-69      | 6234 | 25   | 15.67 | 1175 | 67 | 100 | 2  |
| 16-14A    | 5252 | 26   | 19.90 | 1493 | 62 | 96  | 4  |
| 2-62      | 4724 | 26   | 11.35 | 851  | 59 | 96  | 4  |
| 2-55      | 2423 | 20   | 7.57  | 568  | 55 | 56  | 20 |

(1) 75 trees/acre

Personnel: M. Viveros, Kern County Farm Advisor  
 Dr. D. Kester, W. Micke, UCD

NICKELS ESTATE RESEARCH FARM  
 Arbuckle, California  
 1975 Planting  
 Block No. 1

1981

| <u>Variety</u>                                | <u># Nuts<br/>/Tree</u> | <u>Average<br/>Size<br/>#/oz.</u> | <u>lbs./<br/>Tree</u> | <u>Per Acre<br/>Yield(1)</u> | <u>Shelling<br/>%</u> | <u>%<br/>Sealed</u> | <u>%<br/>NOW</u> | <u>Full<br/>Bloom<br/>Date</u> |
|---|-------------------------|-----------------------------------|-----------------------|------------------------------|-----------------------|---------------------|------------------|--------------------------------|
| <b>A. <u>Early Blooming</u></b>               |                         |                                   |                       |                              |                       |                     |                  |                                |
| 5A-20   | 5163                    | 28                                | 11.5                  | 863                          | 72                    | 61                  | 1                | F 21                           |
| Jordanolo 1-70                                | 3960                    | 23                                | 11.0                  | 825                          | 59                    | 61                  | 0                | F 18                           |
| Peerless 2-70                                 | 3409                    | 25                                | 8.6                   | 645                          | 37                    | 100                 | 0                | F 23                           |
| Ne Plus Ultra 1-63                            | 3062                    | 22                                | 8.6                   | 642                          | 57                    | 100                 | 1                | F 21                           |
| Peerless 1-65                                 | 3032                    | 25                                | 7.5                   | 562                          | 37                    | 100                 | 0                | F 23                           |
| Ne Plus Ultra 2-70                            | 2827                    | 23                                | 7.7                   | 576                          | 53                    | 100                 | 6                | F 21                           |
| <b>B. <u>Nonpareil Bloom: Pollinizers</u></b> |                         |                                   |                       |                              |                       |                     |                  |                                |
| Fritz   | 6600                    | 34                                | 12.0                  | 903                          | 48                    | 65                  | 1                | F 28                           |
| Norman  | 6081                    | 35                                | 11.0                  | 821                          | 58                    | 99                  | 0                | M 1                            |
| Carmel  | 4919                    | 28                                | 11.2                  | 841                          | 52                    | 67                  | 0                | M 1                            |
| Price   | 4689                    | 29                                | 10.0                  | 749                          | 56                    | 95                  | 0                | M 3                            |
| Robson  | 4278                    | 27                                | 9.9                   | 746                          | 52                    | 97                  | 3                | F 28                           |
| 5A-3  | 3881                    | 28                                | 8.8                   | 659                          | 56                    | 100                 | 0                | F 28                           |
| Milow   | 3370                    | 31                                | 6.7                   | 499                          | 64                    | 97                  | 1                | F 23                           |
| 23-122  | 3248                    | 30                                | 6.5                   | 485                          | 52                    | 89                  | 0                | M 1                            |
| Granada                                       | 3219                    | 33                                | 6.2                   | 464                          | 47                    | 96                  | 0                | F 28                           |
| Nonpareil 3-8-2-70                            | 3103                    | 25                                | 7.8                   | 586                          | 56                    | 74                  | 0                | F 28                           |
| 69-60   | 2762                    | 26                                | 6.8                   | 506                          | 43                    | 81                  | 0                | M 1                            |
| Harvey  | 2696                    | 24                                | 7.0                   | 527                          | 62                    | 45                  | 8                | M 3                            |
| K-13N   | 2658                    | 26                                | 6.4                   | 481                          | 53                    | 33                  | 3                | F 26                           |
| Vesta   | 2423                    | 21                                | 7.1                   | 532                          | 47                    | 97                  | 0                | F 28                           |
| <b>C. <u>Mission Bloom: Pollinizers</u></b>   |                         |                                   |                       |                              |                       |                     |                  |                                |
| Butte   | 6364                    | 34                                | 11.6                  | 872                          | 48                    | 84                  | 0                | M 1                            |
| Mission 3-6-1-65                              | 6030                    | 31                                | 12.2                  | 912                          | 41                    | 100                 | 0                | M 3                            |
| Mission 3-6-5-67                              | 5897                    | 30                                | 12.2                  | 915                          | 44                    | 100                 | 0                | M 3                            |
| Mission 3-6-2-71                              | 4264                    | 30                                | 8.9                   | 666                          | 42                    | 100                 | 0                | M 3                            |
| Thompson                                      | 3154                    | 25                                | 8.1                   | 604                          | 54                    | 100                 | 0                | F 28                           |
| Carrion                                       | 2932                    | 27                                | 6.9                   | 515                          | 54                    | 73                  | 0                | M 1                            |
| <b>D. <u>Nonpareil Source Clones</u></b>      |                         |                                   |                       |                              |                       |                     |                  |                                |
| Nonpareil 3-8-5-72                            | 3493                    | 23                                | 9.6                   | 722                          | 56                    | 68                  | 0                | F 28                           |
| Nonpareil 3-8-7-72                            | 3344                    | 25                                | 8.3                   | 619                          | 54                    | 71                  | 0                | F 28                           |
| Nonpareil 3-8-2-70                            | 3103                    | 25                                | 7.8                   | 586                          | 56                    | 74                  | 0                | F 28                           |
| Nonpareil 3-8-4-72                            | 3029                    | 24                                | 7.8                   | 583                          | 57                    | 60                  | 0                | F 28                           |

(1) 75 trees/acre

Personnel: Tom Aldrich, Colusa County Farm Advisor  
 Dr. D. Kester, R. Asay, W. Micke, UCD

NICKELS ESTATE RESEARCH FARM  
 Arbuckle, California  
 1977 Planting  
 Block No. 2

1981

| <u>Variety</u>                        | <u># Nuts<br/>/Tree</u> | <u>Average<br/>Size<br/>#/oz.</u> | <u>lbs./<br/>Tree</u> | <u>Per Acre<br/>Yield</u> | <u>Shelling<br/>%</u> | <u>%<br/>Sealed</u> | <u>%<br/>NOW</u> | <u>Full<br/>Bloom<br/>Date</u> |
|---------------------------------------|-------------------------|-----------------------------------|-----------------------|---------------------------|-----------------------|---------------------|------------------|--------------------------------|
| <u>A. Nonpareil Source Clones</u>     |                         |                                   |                       |                           |                       |                     |                  |                                |
| 3-8-12-72                             | 2231                    | 26                                | 5.2                   | 392                       | 51                    | 63                  | 2                | F 28                           |
| 3-8-9-72                              | 2205                    | 23                                | 5.9                   | 442                       | 57                    | 86                  | 0                | F 28                           |
| 3-8-10-72                             | 2199                    | 22                                | 6.2                   | 464                       | 58                    | 55                  | 2                | F 28                           |
| 3-8-8-72                              | 1948                    | 22                                | 5.5                   | 409                       | 59                    | 44                  | 0                | F 28                           |
| 3-8-5-72                              | 1921                    | 21                                | 5.7                   | 424                       | 58                    | 65                  | 0                | F 28                           |
| 3-8-11-72                             | 1738                    | 23                                | 4.7                   | 350                       | 58                    | 78                  | 0                | F 28                           |
| <u>B. Mission Source Clones</u>       |                         |                                   |                       |                           |                       |                     |                  |                                |
| 3-6-2-71                              | 4577                    | 31                                | 9.3                   | 699                       | 41                    | 100                 | 0                | M 3                            |
| 3-6-5-67                              | 4102                    | 30                                | 8.6                   | 639                       | 41                    | 100                 | 0                | M 3                            |
| 3-6-1-65                              | 3661                    | 31                                | 7.5                   | 562                       | 39                    | 100                 | 0                | M 3                            |
| <u>C. Nonpareil Bloom: Pollinizer</u> |                         |                                   |                       |                           |                       |                     |                  |                                |
| 2-62                                  | 3336                    | 25                                | 8.3                   | 625                       | 56                    | 93                  | 0                | F 27                           |
| 1-46                                  | 3319                    | 29                                | 7.2                   | 536                       | 45                    | 75                  | 0                | F 25                           |
| K16-14                                | 3150                    | 27                                | 7.2                   | 541                       | 54                    | 100                 | 0                | M 7                            |
| 23.5-16-40B                           | 2608                    | 27                                | 6.0                   | 444                       | 47                    | 100                 | 0                | M 1                            |
| 1-69                                  | 2302                    | 26                                | 5.5                   | 411                       | 50                    | 93                  | 0                | M 1                            |
| 88-66                                 | 2066                    | 26                                | 4.9                   | 367                       | 42                    | 96                  | 0                | M 1                            |
| 24-5Z                                 | 1947                    | 27                                | 4.6                   | 345                       | 41                    | 100                 | 0                | M 3                            |
| 88-55                                 | 1708                    | 25                                | 4.3                   | 323                       | 42                    | 93                  | 0                | M 7                            |
| 2-13                                  | 1434                    | 26                                | 3.4                   | 255                       | 49                    | 99                  | 2                | F 27                           |
| 79-49                                 | 1206                    | 29                                | 2.6                   | 198                       | 43                    | 100                 | 0                | M 1                            |
| <u>D. Mission Bloom: Pollinizer</u>   |                         |                                   |                       |                           |                       |                     |                  |                                |
| 3-63                                  | 4241                    | 35                                | 7.6                   | 566                       | 50                    | 100                 | 0                | M 1                            |
| 5-58                                  | 4026                    | 31                                | 8.0                   | 601                       | 50                    | 100                 | 0                | M 3                            |
| 3-5W                                  | 1852                    | 40                                | 2.9                   | 218                       | 41                    | 100                 | 0                | M 3                            |

Personnel: Tom Aldrich, Colusa County Farm Advisor  
 Dr. D. Kester, R. Asay, W. Micke, UCD

| <u>Variety</u>                              | <u># Nuts<br/>/Tree</u> | <u>Average<br/>Size<br/>#/oz.</u> | <u>lbs./<br/>Tree</u> | <u>Per Acre<br/>Yield (2)</u> | <u>Shelling<br/>%</u> | <u>%<br/>Sealed</u> | <u>%<br/>NOW</u> |    |
|---|-------------------------|-----------------------------------|-----------------------|-------------------------------|-----------------------|---------------------|------------------|----|
| <u>A. Ne Plus Ultra Bloom</u>               |                         |                                   |                       |                               |                       |                     |                  |    |
| 5A-20                                       | 7787                    | 23                                | 21.2                  | 1567                          | 70                    | 64                  | 12               |    |
| Jordanolo                                   | 7736                    | 18                                | 26.9                  | 2015                          | 69                    | 72                  | 28               |    |
| Ne Plus Ultra                               | 6466                    | 18                                | 22.5                  | 1688                          | 43                    | 64                  | 16               |    |
| <u>B. Nonpareil Bloom: Pollinizers</u>      |                         |                                   |                       |                               |                       |                     |                  |    |
| Fritz (1)                                   | 12332                   | 27                                | 28.5                  | 2141                          | 51                    | 96                  | 0                |    |
| 5A-3  | 9804                    | 29                                | 21.1                  | 1585                          | 61                    | 100                 | 0                |    |
| Milow                                       | 9684                    | 27                                | 22.4                  | 1682                          | 74                    | 88                  | 12               |    |
| 23-122                                      | 8867                    | 27                                | 20.5                  | 1540                          | 55                    | 100                 | 8                |    |
| Norman                                      | 8228                    | 27                                | 19.0                  | 1429                          | 58                    | 44                  | 0                |    |
| Vesta                                       | 7523                    | 23                                | 20.4                  | 1533                          | 53                    | 100                 | 0                |    |
| Price                                       | 7456                    | 28                                | 16.6                  | 1248                          | 53                    | 68                  | 0                |    |
| Granada                                     | 6506                    | 29                                | 14.0                  | 1052                          | 56                    | 78                  | 4                |    |
| Robson                                      | 6450                    | 23                                | 17.5                  | 1315                          | 67                    | 100                 | 16               |    |
| K13N  | 5867                    | 25                                | 14.7                  | 1100                          | 61                    | 92                  | 4                |    |
| Merced                                      | 5433                    | 26                                | 13.1                  | 976                           | 64                    | 88                  | 20               |    |
| Harvey                                      | 5181                    | 25                                | 13.0                  | 971                           | 63                    | 88                  | 0                |    |
| Carmel                                      | 3810                    | 23                                | 10.4                  | 776                           | 60                    | 100                 | 0                |    |
| <u>C. Mission Bloom: Pollinizers</u>        |                         |                                   |                       |                               |                       |                     |                  |    |
| CP 5-58                                     | 8562                    | 30                                | 17.8                  | 1338                          | 49                    | 100                 | 0                |    |
| Butte                                       | 7834                    | 28                                | 17.5                  | 1312                          | 52                    | 100                 | 4                |    |
| Carrion                                     | 6552                    | 23                                | 17.8                  | 1335                          | 63                    | 100                 | 12               |    |
| Ripon                                       | 5777                    | 29                                | 12.5                  | 934                           | 44                    | 100                 | 4                |    |
| Thompson                                    | 5288                    | 24                                | 13.8                  | 1033                          | 61                    | 80                  | 16               |    |
| <u>D. Nonpareil: Separate Source Clones</u> |                         |                                   |                       |                               |                       |                     |                  |    |
| 3-8-7-72                                    | 10311                   | 24                                | 27.2                  | 2037                          | 65                    | Average<br>4 Rows   | 63               | 5  |
| 3-8-4-72                                    | 10194                   | 22                                | 28.4                  | 2108                          | 66                    | "                   | 53               | 11 |
| 3-8-2-70                                    | 9494                    | 22                                | 26.7                  | 2005                          | 63                    | "                   | 62               | 7  |
| 3-8-5-72                                    | 8700                    | 22                                | 25.0                  | 1871                          | 63                    | "                   | 72               | 7  |
| <u>E. Mission: Separate Source Clones</u>   |                         |                                   |                       |                               |                       |                     |                  |    |
| 3-6-1-65                                    | 7763                    | 26                                | 18.7                  | 1400                          | 44                    | "                   | 100              | 0  |
| 3-6-2-71                                    | 7662                    | 26                                | 18.4                  | 1381                          | 43                    | "                   | 100              | 0  |
| 3-6-5-67                                    | 7347                    | 25.5                              | 18.0                  | 1348                          | 44                    | "                   | 100              | 0  |

(1) Mission as pollinizer  
(2) 75 trees/acre

Personnel: Dr. R. Baldie, CSUC  
Dr. D. Kester, R. Asay, UCD