ABSTRACT

Monitoring pistillate flower abscission (PFA) was continued in 1985. With Serr, differences in PFA among trees and sites were again found. Depending upon individual sites, levels of PFA either increased, decreased, or were unchanged with the same limbs versus 1984. The range of PFA in ongoing plots was 26 to 92% in 1985. In the Serr--nitrogen plot, PFA increased from 27 to 92% across the plot, a distance of 13 trees. In the first year of N deficiency versus sufficiency no clear association of PFA with N treatment was evident. Although there was a correlation between PFA and N fertilization, some other factor within the plot appeared to more strongly influence the extent of abscission. PFA averaged 4% in the Hartley--N plot and there was no difference with N treatment. Sunland, Howard, and Chandler were monitored for the sixth year. PFA of Sunland and Howard remained low but Chandler increased to 42% (21% in 1984). This was the first year in which any of these cultivars exceeded 22% PFA. Monitoring of PFA was begun with 1- and 2-year-old scions. Results for field trees of Serr in Tulare County are reported separately. One-year-old scions of Sunland and Serr grafted on single and much older root systems at a high PFA site at Davis experienced 6 and 50% PFA, respectively.

OBJECTIVES

To continue monitoring PFA to characterize its occurrence, especially at locations with differing levels of abscission and with Serr scions of different ages and with different cultivars. To investigate the role of N nutritional status in PFA. To attempt to establish a role of a root physiological--soil environmental interaction in PFA.

PROCEDURES

Monitoring of PFA consists of inspection of all shoots of sample limbs at approximately 4-5 day intervals from before the time pistils are evident until after emergence is completed. Numbers of vegetative shoots on each limb are also recorded. Trees in N fertilization--isotope plots (84 WMB-3) are being extensively monitored. Plant tissue samples are being obtained to relate N status with PFA. Monitoring of PFA began with Serr trees in their second and third leaves and with one-year-old scions of Sunland and Serr grafted on single, older J. hindsii roots at a high PFA site.

RESULTS AND CONCLUSIONS

Monitoring of the same Serr trees at sites differing in PFA in 1984, and for some earlier years, was continued. One moderate sized and one large plot were terminated in 1985. Levels of PFA were generally the same in 1985 and in 1984. Depending upon the plot, levels of PFA either increased, decreased, or were unchanged. The range of PFA in 1985 in ongoing plots was 26 to 92%.
Levels of PFA in 1985 for the more recently introduced UC cultivars were as follows: Sunland, 11%; Howard, 18%; and Chandler, 42% (21% in 1984). This was the first time in 6 years of monitoring of these 3 cultivars where PFA exceeded 22% for any of them. PFA for Serr in the same planting was 62% in 1985.

With older Serr trees, trends towards increasing PFA with increasing age have not been found. Until 1985, Serr trees younger than their seventh leaf have not been monitored. Measurement of PFA with Serr trees in their second and third leaf was started with the intent of continuing this with the same trees for several years. A low incidence of PFA was recorded in the same trees for several years. A low incidence of PFA was recorded in these plots (reported separately, Sibbett and Catlin). Serr and Sunland scions grafted in 1984 onto regrowth from single rootstocks, where previous scions had been removed, flowered in 1985. Average PFA was 50% for Serr and 6% for Sunland. Much older Serr trees 10-50 m distant from the newly grafted ones have regularly experienced very high PFA.

Monitoring of Serr and Hartley in the N nutrition--isotope plots (84 WMB-3) was intensified in 1985. Differential response to + N fertilization became evident in the Serr plot but not with Hartley. Numbers of limbs per tree monitored was increased to 3 in both plots to improve the ability to detect differences. PFA in the Hartley averaged 4% and there was no difference with N treatment. With Hartley abscission of developing nuts apparently due to inadequate pollination approached 50%. With the Serr plots, PFA increased from 27 to 92% across the plot, a distance of 13 trees. This near-linear increase in PFA reinforces conclusions developed earlier that this phenomenon is most strongly associated with planting site. In this first year of N sufficiency--imposed deficiency, there may have been some influence of added N in reducing PFA. However, this appeared to be of only moderate effectiveness. Tissue analyses to related N status to PFA are incomplete. The degree of fruitfulness of shoots was essentially constant and relatively high for all trees.

Regression analysis of percent PFA versus percent fruitfulness for all Serr limbs monitored during 1979 through 1983 did not show a significant relationship except in 1979 and in this year it was negative.