

# Effect of Time of Pollination on Nut Production in 'Kerman' Pistachio

by Julian C. Crane and Ben T. Iwakiri

Unlike most other fruit and nut trees where opening of the flower petals signals the time at which the female elements are receptive to pollination, the flowers of pistachio, exclusive of sepals, consist only of naked ovaries, they are imperfect (contain no stamens) and have no petals. Consequently, we have found it very difficult to pinpoint the time or stage of development when the individual flowers composing the pistachio inflorescence are receptive to pollination. To be able to do this is not only important to the researcher in his breeding and pollination studies but it is also important to the grower who may someday wish to artificially pollinate his trees.

Since little or no change in appearance other than size of the individual flowers takes place during the bloom period, an alternate parameter was needed for judging the time when pollination should take place to bring about the greatest production of nuts. The data presented here indicate that degree of inflorescence development may be a satisfactory criterion in that respect.

This study was made in 1981 and 1982, the "off" and "on" years, respectively, in the alternate bearing cycle of the trees. Five 20-year-old 'Kerman' trees were selected and branches were enclosed in bags made of tightly woven, white cotton gabardine, material that had proven satisfactory in walnut breeding operations. The bags were put in place before the inflorescences had expanded sufficiently to expose the stigmas



Figure 1. Stage of inflorescence development when bagging was done on April 10, 1981.



Figure 2. Stage of inflorescence development when pollinated on April 13, 1981. This stage produced the largest number of nuts per cluster.

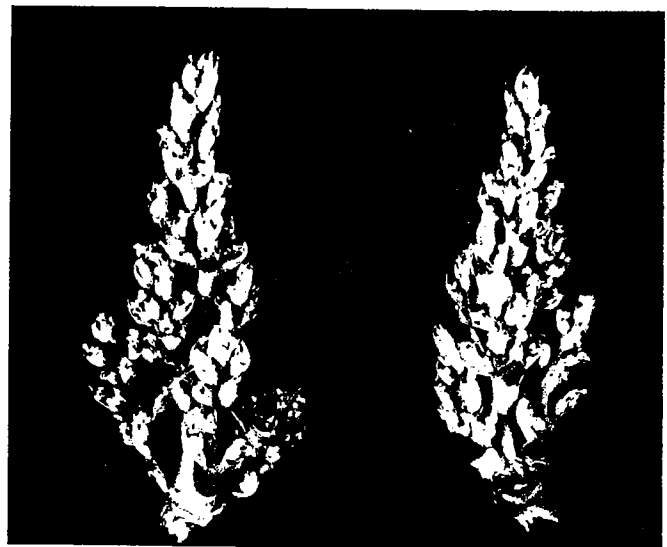


Figure 3. Stage of inflorescence development on April 17, 1982, when nut production per cluster was minimal.

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*continued*

of the individual flowers (Figure 1). They were removed 2 weeks later after cessation of pollen shedding from nearby male trees.

Beginning about the day the first stigmas of some of the flowers were exposed (4/13 and 4/23 in 1981 and 1982, respectively) as a result of growth of inflorescence, male inflorescences shedding pollen on nearby 'Peters' trees were picked and used to pollinate the bagged 'Kerman' inflorescences. This procedure was repeated daily, or every other day, throughout the bloom period using different 'Kerman' inflorescences and fresh 'Peters' inflorescences each day.

The data in Table 1 show that the bloom period spanned 10 days in 1981 and 8 days in 1982. The length of the bloom period is not fixed, of course, but is dependent upon existing environmental conditions at the time of bloom. It is clearly evident from the data that the first 2 to 3 days of the bloom period are critical from the standpoint of pollination. The production of nuts by flowers pollenized after that period tended to decrease markedly to low levels. Thus, viability of the pollen or the female elements, or both, may be of relatively short duration.

In addition to elucidating the importance of the initial part of the bloom period, the data in Table 1 bring out two other points. First, the number of nuts produced per cluster in the on year (1982) was from 2 to 3 times greater than that of the off year. Heavy nut production one year apparently reduces reserves in the tree to the point where they limit fruit set and vegetative growth the next. Secondly, as shown with other fruit and nut trees, conditions brought about by enclosing pistachio flowers in cloth bags are not conducive to optimum nut production. Open-pollina-

ted (unbagged) flowers produced from 1-1/2 to 2 times the number of nuts per cluster as bagged flowers that were hand-pollinated.

**Table 1.** Number of filled nuts per cluster as affected by time of pollination in 'Kerman' pistachio.

1981		1982	
DATE POLLINATED	NUTS PER CLUSTER	DATE POLLINATED	NUTS PER CLUSTER
4/13	2.5	4/23	8.4
4/14	2.3	4/24	8.0
4/15	2.0	4/25	1.4
4/16	1.7	4/26	4.3
4/17	1.1	4/27	1.1
4/20	0.7	4/30	1.0
4/22	0.7		
Open-pollinated control	5.0		12.7
Bagged control	0.0		0.0

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