Apricot Irrigation

tests indicate one irrigation not enough for best results

A. H. Hendrickson and F. J. Veihmeyer

An irrigation before harvest, one about the last week in July and probably one in early September would be a rational irrigation program for apricot trees on deep soil—such as that at Winters.

The importance of the continuity of the supply of readily available soil moisture was a striking feature of the results obtained in a continuing study of the responses of apricot trees to different irrigation treatments.

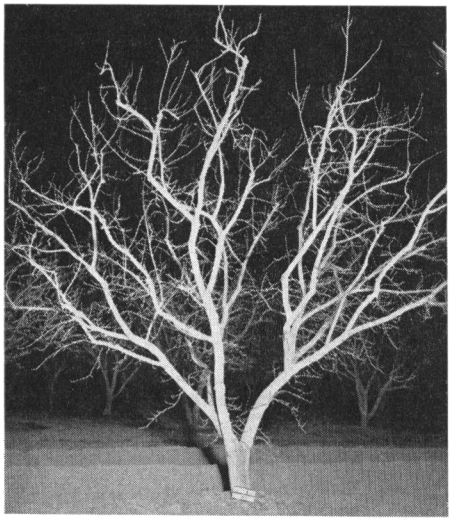
An experiment in differential irrigation treatment was started in 1947 with a block of apricot trees in the Wolfskill experimental orchards.

The orchard consists of trees of the Royal variety on apricot root planted—in 1939—24 feet apart on the square system. The soil is classified as a Yolo silty clay loam.

The experiment was planned in such a way that the trees were brought into full bearing under a system of uniform treatment as regards irrigation and other cultural practices. Growth and yield records prior to differential irrigation treatment showed that the trees were remarkably uniform. The orchard was then divided into sixteen suitable plots, and four different irrigation treatments started.

The plots contained either eight or ten experimental trees surrounded by guards that received the same irrigation treatment.

Typical apricot tree from an unirrigated treatment showing absence of blossoms.



The treatments were designated by the letters *A*, *B*, *C*, and *D*. Soil samples to a depth of six feet at biweekly intervals provided a soil moisture record of each plot.

Treatment plot *A* was irrigated often enough to keep the soil moisture content above the permanent wilting percentage in the top six feet throughout the growing season. Four irrigations, including one in May before picking, were usually applied. The harvest period occurred in late June and early July.

Treatment plot *B* was irrigated immediately after harvest and thereafter whenever the soil moisture in the top three feet was reduced to about the permanent wilting percentage. Because of the harvest period, when irrigation was not possible, this plot was generally subjected to lack of readily available moisture in the top three feet for one or two weeks in late June and early July.

Treatment plot *C* was irrigated once immediately after harvest and not thereafter. Like plot *B*, it was subjected to dry soil condition for a relatively short period during harvest. Dry soil conditions prevailed again, beginning about the middle of August, and continuing until the fall rains.

Treatment plot *D* was not irrigated during the growing season. The soil moisture in this plot was reduced to about the permanent wilting percentage late in June and was without readily available moisture, after about the first of July, until the moisture was replenished by fall rains.

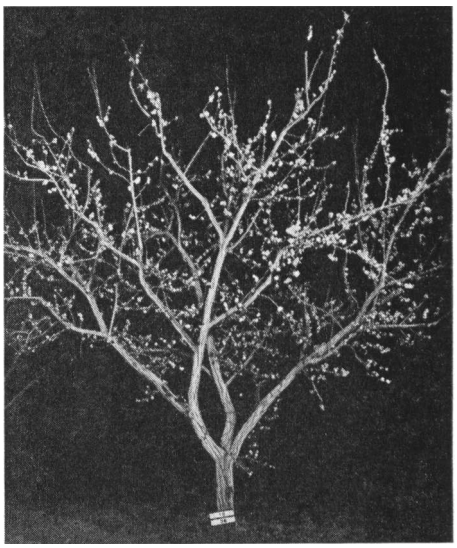
Yields

No significant differences in yields were obtained the first year.

Beginning with 1948 the yields in certain plots showed effects of the irrigation treatments and continued to do so through 1950. The results obtained during the first four years were graphed as cumulative yields—the 1948 average yields were added to the 1947 yields and so on.

No significant differences in cumulative yields between treatments *A* and *B* were obtained during the four-year period.

The cumulative yields from treatment *C* were slightly less than those of *A* and *B* in 1948 and were significantly smaller in 1949 and 1950.



Typical apricot tree from an irrigated treatment showing an abundance of blossoms.

Treatment *D* produced a very light crop, averaging 41 pounds per tree in 1948, following the first summer when it was subjected to dry soil conditions after late June. Some trees in this treatment did not produce a single fruit.

Climatic conditions in 1948 were different from 1947. The season was late and cool and had more than normal rain in May. As a result the readily available soil moisture in *D* plot was not exhausted until early in August or about a month later than usual. The combination of light crop and the cool season apparently favored the formation of fruit buds in the summer of 1948 and a satisfactory set of fruit in the spring of 1949. In 1949 the trees under treatment *D* exhausted the readily available soil moisture about the middle of June and a light crop followed in 1950. Nearly every tree in this plot showed pronounced alternation in bearing.

The cumulative yields of treatment *D* were significantly less than those of *A*, *B*, or *C* in 1948, 1949, and 1950. Plot *D* has yielded less than any of the other three and treatment *C*, with but a single irrigation during the summer, is falling behind the leaders, *A* and *B*.

Tree Growth

The increase in size of trees, as measured by gains in cross-section areas of tree trunks presents a slightly different picture, in that certain responses were obtained during the first season of differential irrigation treatment.

The average gain in cross-section area of tree trunks for the three years before the experiment started ranged from 41 to 46 square centimeters. In 1947, the gains in cross-section areas of the trees

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Summer Weight Gain

Brafords, Herefords compared for seasonal gains in Imperial Valley

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Brafords gained more during the summer in tests at the Imperial Valley Field Station; yielded more meat when slaughtered but usually brought a little less money per pound than Herefords.

Most of the data obtained in the tests indicate that the Brafords do not grade out quite as high as Herefords do when both are fed similar rations for the same length of time. Brafords and Herefords usually make excellent gains on the Imperial Valley's spring pasture and during early summer, but show a drop in daily gain during August when both days and nights are extremely hot.

Several tests were conducted over a three-year period to determine the rates of gain of Hereford and Braford cattle during the different seasons of the year at the Imperial Valley Field Station of the University of California.

Six Hereford steers, six Hereford heifers, six Braford steers, and six Braford heifers were purchased in Bakersfield and received at the station on December 7, 1948. All the calves were from good grade Hereford cows. The animals were fed as a group, so comparative food consumption rates on the four lots are not available but feed records on the whole lot were kept.

Cold weather and muddy pastures made it necessary for the animals to be fed in the dry lot from December 7 to March 4. During that period all groups made good gains; the average daily gain for the four lots was 1.47 pounds per head per day. The ration for this phase of the test was mostly alfalfa hay with a little grain hay.

During the pasture season, the animals were on good alfalfa pasture and received about 3.5 pounds of alfalfa and grain hay per head per day.

The Braford steers gained 2.15 pounds per head per day during the spring pasture period—March 5 to June 13—while the Hereford steers gained 1.82 pounds. Summer pasture gains—June 14 to September 14—for the Braford steers averaged 2.05 pounds per head per day while the Herefords gained an average of 1.58 pounds.

Although the summer gains for all lots are good, there was a drop in daily gain from August 5 to September 14. During this period both the days and the nights were hot.

Hereford and Braford steers made an average daily gain of 2.03 pounds and 2.60 pounds respectively, from June 14 to August 4 but gained only 1.02 pounds and 1. 35 pounds during the August and September period. All lots made good gains during the 37-day grain feeding period.

The test animals were shipped to the Los Angeles Union Stock Yards on October 23 and sold by lots on October 24. The Hereford steers brought 26½¢ per pound and the Braford steers 25¼¢ per pound, while the heifer lots were both sold for 24¢ per pound. Dressing percentages for the Brafords were 2% to 4% higher than the Herefords. Other data collected has shown this same difference.

Animals on good alfalfa pasture in the valley make excellent gains and do well during the first part of the summer. There is a definite drop in gains during the latter part of the summer in both Braford and Hereford cattle. The Braford steers made 0.5 pounds more gain per pound during the summer—June 14 to September 14—than the Hereford steers.

Other summer tests have shown differences in daily gains between Brafords and Herefords to range from 0.4 to 1.1 pounds. During the summer, different groups of Herefords on good pasture, with shade, water, and a little hay during the day have gained 0.8 pound to 1.58 pounds per day.

The Herefords that gained 0.8 pound per day were brought into the valley during July. Observations indicate that Herefords will do better if they are brought into the valley during the spring and are permitted to become adjusted to the hot weather gradually. Consideration should be given to selecting Herefords from warmer areas for summer feeding rather than from our cooler states such as Colorado and Montana.

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in plot *A* were 43 square centimeters—the largest—and were 21 square centimeters in plot *D*—the smallest. The gains in treatment *A* were significantly larger than in *B*, *C*, and *D* while those in *D* were significantly smaller than the other three. The differences between *B* and *C* were not significant.

The responses to the change in irrigation were noticeable in increases in growth the first year after differential treatment was started but did not appear in yields until the second year. The trends in both cases have continued through 1950.

Results

The results obtained from treatment *A*, which did not reach the permanent wilting percentage at any time, showed consistently good production and growth during the test.

Treatment *B*, which reached the permanent wilting percentage and remained there for a short period before being irrigated, produced slightly less than treatment *A* but the difference in cumulative yields between *A* and *B* was not significant. The gains in cross-section of *B*, however, were significantly less than those of *A*.

The irrigation treatment of *B* has apparently been adequate as far as yields are concerned, but increase in growth was less than in *A* because of the drought during the picking season.

Treatment *C*, with only a single irrigation, had significantly smaller cumulative yields than either *A* or *B* and grew less than *A*.

Treatment *D* with no irrigation is far below the other three treatments both in yield and growth.

A short period without readily available moisture as occurred in treatment *B* apparently did not affect the crop which was essentially mature before the dry soil conditions prevailed, but did affect the increase in growth which was not completed before the readily available moisture was exhausted.

Treatment *C*, although it bore and grew fairly well, shows that one irrigation, under conditions of this experiment was not enough for best results. On the average, treatment *C* was without available soil moisture after early September.

Treatment *D* responded by low yields and a relatively small amount of new growth.

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