

Section VII Foliage and Seed Insects

A NOTE ON THE EFFECT OF HIGH THRIPS POPULATIONS ON ALFALFA FLOWER LONGEVITY

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Thrips (*Frankliniella occidentalis*) populations seem to have been high in some alfalfa seed fields in the Treasure Valley of Idaho in the past few years, and some growers are concerned that they may contribute to "blossom drop", a phenomenon of unknown cause that may be reducing seed yield. This phenomenon is characterized by flowers wilting and dropping off of the alfalfa raceme without developing a seed pod. Blossom drop has been reported in fields where lygus bug are not a problem, and where bees are apparently tripping the flowers.

Little data is available on the effect of thrips on blossom longevity or seed yield. However, we suspect that thrips are less likely to cause blossom drop if pollination occurs rapidly, before the flowers wilt. Thus, the possibility of blossom drop caused by these insects may be a function of the rate of pollination.

OBJECTIVES:

1. To determine the longevity of a flower, and the probability that flowers of different ages will develop a pod.
2. To determine how thrips affect flower longevity and probability of developing a pod.
3. To determine how best to sample thrips in alfalfa seed fields, how they vary over the season, and how large a population must be to seriously reduce seed yields.

Methods and Results

1. In small research fields of the variety Arrow we bagged racemes that were about to bloom. When a flower opened on one of these racemes, all other buds were removed, and the raceme stem was marked with colored thread indicating how long the flower was to be left before tripping (up to 5 days). Flowers not yet tripped were checked daily to see if they had

wilted, and tripped flowers were checked for a week or so until there were signs that a curl was forming, or until the flower dropped off and left behind only a bract.

Flowers began to wilt by the 3rd day after opening. None remained open on the 5th day after opening (Fig. 1). The probability of developing a pod declined the older the flower (Fig. 2). However, those few flowers that survived to day 3 or 4 were likely to develop pods when tripped.

2. Where thrips populations were high, flowers rarely lasted more than a day before wilting and few of those flowers developed a curl after tripping (Figs. 3, 4). This is the first data that I am aware of indicating that thrips could have a major effect on seed yield and blossom drop. However, we do not really know yet what is the threshold thrips population to do this damage, or how to determine if a field is at risk for reduced seed yield. So far, I have not seen any commercial fields that had thrips populations as high as my research fields did.

3. Thrips were sampled in research fields that reached outbreak proportions. Two sampling methods were tried: Counting thrips per flower, and using blue and yellow sticky boards.

Thrips reached a high of close to 2.5 per flower on average, with a maximum of 8 per flower. Values were usually higher in the afternoon than in the morning. Average numbers of thrips per flower does not take into account the numbers of thrips moving around the plants between flowers. Thrip in flowers were mostly males.

Thrips were very abundant on all sticky boards, but were more abundant on blue than on yellow. In fact, they were difficult to see on the blue surface, and too abundant to count. Yellow sticky boards were left in the field for one day between 9 am and 4 pm. High numbers of thrips per flower corresponded to counts of over 500 thrips per side of the yellow sticky boards. Putting sticky boards in the fields for several hours and then counting thrips would be too time consuming for growers seeking a method of assessing thrips populations.

Traditional sweep sampling is probably the best method for estimating thrips populations. In the future I will compare sweep samples with other methods of sampling thrips to try to determine when the thrips population is likely to cause damage.

FIGURE 1 Flowers wilted after about three days, if they were not pollinated. Thrips populations were low. N=6 plants.

Temperatures for 6/23-6/30: Mean high 83°F (range 73-90°F) Mean low 48°F (range 41-53°F)

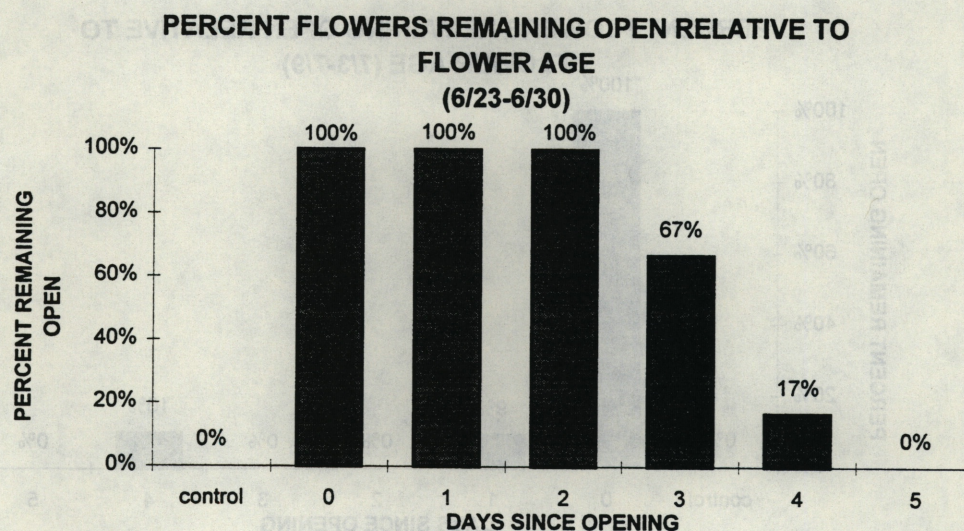


FIGURE 2. The probability of setting curls decreases as open flowers age.

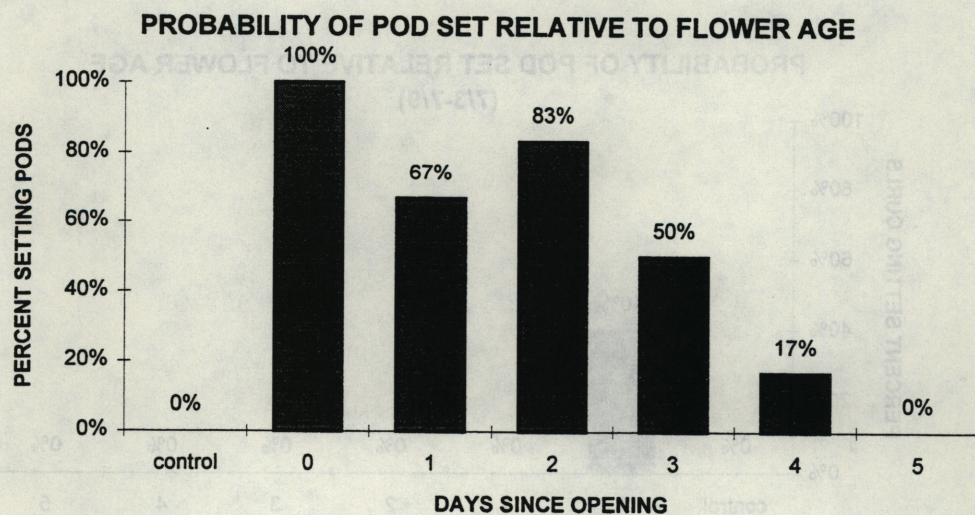


FIGURE 3. In a second test, flowers remained open for only a day before wilting. Thrips populations were high. N=11 plants
 Temperatures for 7/3-7/9: Mean high 90°F (range 81-97°F) Mean low 52°F (range 47-63°F)

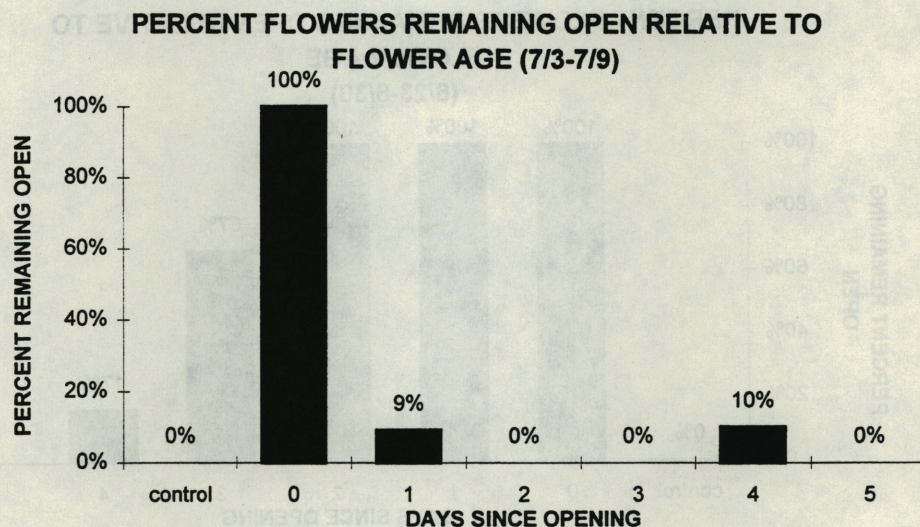


FIGURE 4: Only 4 of the 12 flowers that stayed open long enough to be tripped actually set seed.

