

Weather Can Have Major Impact on Insects

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Local weather patterns have a significant impact on the abundance of insect pests in our crops. Components of weather, mainly temperature and moisture, can either promote insect population growth or cause populations to decline. As we approach the hot and dry weather typical in May and June one can expect insect activity to increase. Why is that?

Temperature is the driving force behind insect development, growth and behavior. Unlike many animals, insects are poikilothermic (“cold-blooded”); that is they are unable to regulate their body temperature and their internal temperature varies along with that of the ambient environmental temperature. Consequently, insect pests such as whiteflies, beet armyworms, cabbage loopers and leafminers develop quickly when temperatures average about 85-90 °F, and develop much slower under cool, winter conditions. In contrast, optimal average temperatures for most aphid species found on lettuce and cole crops is around 55-60 °F. Other behavioral activities such as flight, movement, reproduction, feeding and oviposition are similarly influenced by seasonal temperatures. Under extreme hot (> 120°F) or cold temperatures (<32 °F), insect growth and behavior is greatly restricted, and often lethal.

Moisture also plays a critical role in insect development, especially in the desert. Many insect pests encountered in our crops do not require free moisture to survive. They obtain water through their food supply. For instance, *Liriomyza* leafminers spend their entire egg and larval stages inside melon or lettuce leaves, extracting water and nutrients from plant tissue. However, relative humidity or lack thereof can influence insect growth and behavior by affecting the insect’s ability to regulate water loss. Low humidity is often detrimental to insect development, but most insects found in desert crops have adapted physiological and behavioral mechanisms to prevent dehydration.

Of course, rainfall can be quite deleterious to insects. The most striking example of this was during the recent winter storms we encountered in January where heavy rains caused significant mortality to thrips and aphids on lettuce crops. As a general rule of thumb, cool, wet extremes in weather are the most detrimental to insects because they can promote disease, slow growth rates and interrupt feeding activities. However, there are exceptions to the rule. One insect pest in particular, the seedcorn maggot, thrives under these conditions.

Although wet winter conditions can be detrimental to the winter survival of many of our key insect pests, the extra moisture can also promote the growth of weeds and desert vegetation. This “additional “ vegetation can provide a food source for insects such as aphids and thrips. On the other hand, warm, humid conditions occurring in Yuma in July-September are generally ideal for insect growth and development. Just walk into any cotton or melon field in August and you will see what I mean.

There is no doubt that weather plays a major role in determining the survival and growth rates of insect populations because of its direct impact on them and on their food supply. These interactions have been studied for many years and are fairly well understood. Unfortunately, predicting insect abundance in Yuma is like predicting the weather, but without satellite images.