COOPERATIVE EXTENSION
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Onion Thrips Management in Bulb Onions

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October 7, 2021

Onion thrips (*Thrips tabaci*) are tiny soft insects that range in color from yellow to black as they grow into adults, and its body length is only 1/16". Onion thrips feed on onion leaves by sucking the sap. Populations are favored by hot, dry weather but heavy rain or overhead irrigation may lower populations.

Figure 1: Onion thrips nymphs hiding between leaf blades.

Figure 2: Onion thrips feeding damage in onion leaves.

Crop damage

Onion thrips is the most serious pest in onion crops worldwide. This pest feeds in protected areas of the onion plant between the leaf blades, usually in new emerging leaves. Adult and nymph thrips feed on the onion leaves by piercing the epidermis and removing sap. This feeding activity causes the leaves to turn white and eventually dry out. High-level infestations may cause significant leaf damage that results in a reduction of photosynthetic area, which results in slowed growth, reduced bulb size, and reduced yields. In addition, onion thrips have become an even greater threat to onion crops as this insect can vector Iris Yellow Spot Virus (IYSV), which is a devastating new disease in onions. Onion thrips have developed a widespread insecticide resistance to insecticides that are commonly used by the industry. Therefore, thrips are the main constraint to productive and sustainable production of onion crops.

Figure 3: Iris Yellow Spot Virus damage on onion leaves.

Monitoring

Onion thrips management should start before the onions are in the bulbing stage, since thrips are most damaging to yields at the beginning of the bulbing stage.

- Thrips monitoring should start a week after transplanting seedlings to the field or when the planted onion sets grow 2 leaves.
- Evaluate thrips numbers in the field by randomly sampling entire onion plants.
- Growers should consider counting 10 plants per site. If monitoring finds a total of 100 thrips after less than 10 plants are inspected, the decision would be to spray.

Pesticide Rotation to Control Onion Thrips

As onion thrips are insects that develop pesticide resistance very easily, evaluation of pesticide rotations to control onion thrips in bulb onions was conducted in Kula, Maui in 2020. This trial tested the following insecticides in different spray rotations: Radiant, Agrii-Mek, Movento, Torac, and Dinotefuran. Adjuvants were added to provide superior coverage and penetration of spray solutions. Pesticides were applied on a weekly basis.

Treatment	Pesticides
Blue	Radiant (2) / Agrii-Mek (2) / Movento (2) / Torac (2) ***adjuvant – Phase***
Orange	Agri-Mek (2) / Radiant / Torac (2)/ Agri-Mek / Dinotefuran / Movento ***adjuvant Phase***
Red	Agri-Mek (2) / Radiant /Torac/(2) / Agri-Mek / Dinotefuran / Movento ***adjuvant - Penetrate***
Yellow	Torac (2)/ Radiant (2) / Agri-Mek (2) / Movento (2) **adjuvant - Phase**
Purple	Movento/ Agri-Mek / Radiant / Movento/ Agri-mek / Radiant /Agri-Mek/ Dinotefuran **adjuvant - Phase**
White	Untreated Check **adjuvant - Phase**

Table 1: Pesticide rotation treatments for onion thrips are labeled with different colors. The numbers in () are the number of pesticide applications.

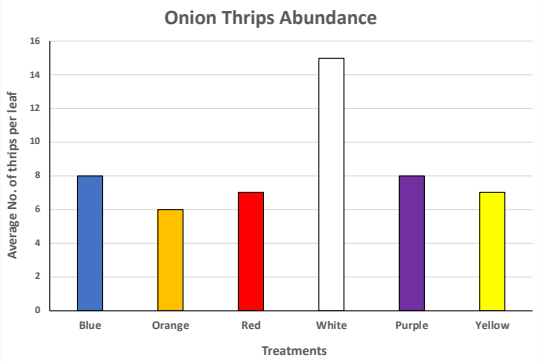

Figure 4: Average numbers of onion thrips per leaf.

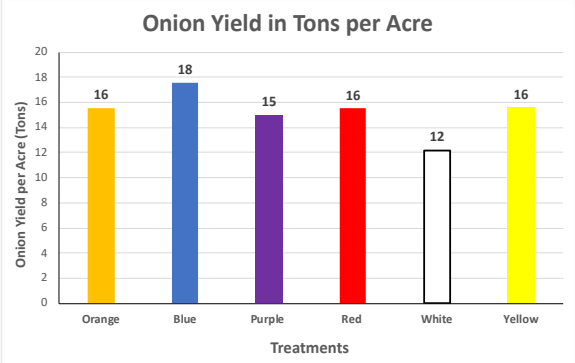

Figure 5: Onion yield under the different pesticide rotation treatments

- Onion thrips abundance were about 50% less in most of the pesticide rotation treatments than the untreated plot.
- The treatment blue (Radiant / Agrii-Mek / Movento / Torac) resulted with the highest yield with about 2 tons greater than the other treatments, and 6 tons more than the untreated plot.
- Using pesticide rotations to control onion thrips will reduce the possibility of thrips building pesticide resistance that will support a sustainable onion production in Hawaii.