# Problems Controlling Alfalfa Weevil Larvae

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Several alfalfa producers from southwest Missouri and southeastern Kansas are reporting problems attaining good control of alfalfa weevil larval infestations. Some fields have required up to three insecticide applications in order to reduce numbers of this pest to below economic threshold levels. Missouri producers reporting problems this spring initially applied one of several available pyrethroid insecticides. After finding substantial numbers of larvae remaining in fields, they again applied a second or third application of insecticides. Pyrethroid class insects provided some reduction in larval numbers, but often larval numbers were still above the economic injury level of an average of one or more larvae per stem of alfalfa. Several producers then selected an organophosphate class of insecticide which substantial reduced larval numbers within a few hours.

Why was there a perceived failure of the pyrethroid class of insecticide? Most of these insecticides have slower knockdown of the pest as compared to the organphosphate class of insecticides which traditional provide good efficacy with mortality occurring within a few hours. However, the pyrethroid insecticides often provide a longer residual control period once they begin killing the alfalfa weevil larvae as compared to organophosphate insecticides. In most Missouri fields where insect numbers remained high after spraying, a wide range of larval instars or worm sizes were observed. This suggests that some larvae were still emerging from eggs while other ranged in size from 1st instars (worm growth stages) to almost mature 4th instars. This indicates that eggs were laid in fall, winter, and spring months and allowed for an extended period of hatch to occur. At the same time, the number of larvae was well over the economic threshold of one or more larvae per stem of alfalfa. When very high numbers of larvae are present, even the best insecticides may kill approximately 90 percent of the larvae under ideal conditions. This leaves from 5 to 10 percent or more of larvae to continue feeding and damaging plant foliage after an insecticide application. Under very heavy infestations of larvae, these survivors may still exceed the economic threshold.

The amount of water used in the formulated spray mixture may be a factor in 2010. For ground application, most insecticides should be applied with a minimum of 10 gallons of water per acre with 20 gallons being recommended for optimal coverage of heavy alfalfa foliage. If applied by air, then 3 gallons or more is desired for optimal coverage. In most years when larval numbers are moderate to low, the 5-10 percent surviving larvae usually resulting in numbers of larvae being below the economic threshold level even though optimal coverage of the alfalfa foliage was not achieved with reduced rates of water. In years with high larval numbers the efficacy of the pesticides may remain the same, but due to the excessive number of larvae present, optimal coverage of the foliage with spray may be required to reduce the large larval population to below economic threshold levels. Other possibilities include improper rate of application (very unlikely as these are experienced applicators and the problem is present regionally), the insecticides being used are defective (not likely as the problem is occurring with several different pyrethroid class insecticides), or that the insects have develop a resistance to the pyrethroid insecticide class which no longer kill a high percent of the target pest (not likely as the insecticides worked well in past years and a gradual decreasing in efficacy is most likely to occur if resistance is a factor in this problem). Although pyrethroid class insecticides can effectively control alfalfa weevil larvae in most years, the heavy larval populations and weather conditions experiences this spring may require the use of an organophosphate insecticide to obtain optimal knockdown of the larval population. Δ

**Table 1. Recommended Insecticides for Control of Alfalfa Weevil Larvae in Alfalfa - 2010**

| Chemical Name | Common Name | Insecticide Class | Rate of Formulated Material | Rate of Active Ingredient (a.i.) |
|---|---|---|---|---|
| Beta-cyfluthrin | *Baythroid XL | pyrethroid | 1.6 to 2.8 fl oz/acre | 0.0125 to 0.022 lbs a.i./acre |
| Chlorpyrifos | *Lorsban 4 lorsban 4 | organophosphate | 1 to 2 pt/acre | 0.5 to 1 lbs a.i./acre |
| Chlorpyrifos-4E | *Lorsban-4E | organophosphate | 1 to 2 pt/acre | 0.5 to 1 lbs a.i./acre |
| | *numerous products | | see specific labels | see specific labels |
| Chlorpyrifos-4E plus | *Cobalt | organophosphate | 19.0 to 38.0 fl oz/acre | |
| Gamma-cyhalothrin | | pyrethroid | | |
| Cyfluthrin | *Tombstone | pyrethroid | 1.6 to 2.8 fl oz/acre | 0.025 to 0.044 lbs a.i./acre |
| Gamma-cyhalothrin | *Proaxis | Gamma-cyhalothrin | 2.56 to 3.84 fl oz/acre | 0.02 to 0.03 lbs a.i./acre |
| Lambda-cyhalothrin | *Warrior | pyrethroid | 2.56 to 3.84 fl oz/acre | 0.02 to 0.03 lbs a.i./acre |
| | *numerous products | | see specific labels | see specific labels |
| Methyl Parathion | *Penncap-M Methyl 4EC | organophosphate | 1 pt/acre | 0.5 lbs a.i./acre |
| Phosmet | Imidan 70-W | organophosphate | 1 to 1-1/3 lbs/acre | |
| Zeta-cypermethrin | *Mustang Max EC | pyrethroid | 2.24 to 4.0 fl oz/acre | 0.014 to 0.025 lbs a.i./acre |

Read and follow all label directions, precautions, and restrictions.
*Designates a restricted use product.

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