

MANAGING COMPLEXES OF PESTS FOR  
MAJOR CROPPING SYSTEMS

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Situation

For the last quarter century, California has been the number one agricultural state in the nation. Its highly diversified agriculture produces about 250 different commodities, with no one crop dominating the state's farm economy. This necessitates the development and expansion of effective integrated approaches to suppress an entire pest complex not only on a single crop but also upon a variety of crops within a system.

Alfalfa, cotton, lettuce and sugar beets are attacked by some 30 species of insect and mite pests plus at least 3 species of plant pathogenic nematodes.

The key insect pests of alfalfa, cotton, lettuce and sugar beets cause a loss in excess of \$50 million annually as estimated by the California State Department of Agriculture. The total cost of insect control on these crops are not available at this time, but we do know that on these crops it is high. The cost of insect control on cotton in lower southern California deserts average \$85/acre. The control costs for insects on alfalfa hay is about \$20/acre, while costs on sugar beets is close to \$50-\$60/acre and on lettuce \$100/acre.

Also, the widespread and frequent use of pesticides has been shown to have harmful side effects on other crops, i.e. such repeated usage of pesticides in cotton has resulted in damaging insect population levels of beet armyworms, cabbage loopers, tobacco budworm, whiteflies and aphids. (Lettuce and sugar beet plantings have been plagued with beet armyworm that have been uncontrollable in alfalfa and cotton in recent years.) When pesticide applications are reduced other secondary or non-target pests are less of a problem and less likely to move into adjacent crops. Damage can also be prevented by a properly timed cutting or insecticide application on alfalfa hay (Stern et al. 1964; 1967). All alfalfa hay pests are attacked by natural enemies including parasites, predators and disease producing microorganisms so the natural enemies commonly prevent these pests from increasing to levels which cause economic damage. It has been demonstrated that alfalfa serves as a reservoir for a great variety of beneficial insects which may move from the hay fields to other plantings such as cotton and sugar beets and may be significant factors in helping to control pests of these crops. For these reasons conservation of beneficial insects is important in alfalfa fields and this factor should be considered in all control practices.

Interrelations of Insects on Alfalfa Hay and Cotton

Injurious and beneficial insect population records were made on alfalfa hay and cotton in 1975 and 1976. The records were initiated about the time of peak squaring in cotton. Insect population counts were taken from sweepings of alfalfa and nearby cotton.

Lygus bugs were found to be the main injurious forms which appeared on alfalfa and cotton in high numbers throughout the growing season. Beet armyworm and cabbage loopers were found on both alfalfa and cotton in August and September but never in sufficient numbers to be considered damaging on these crops. Populations of beneficial insects during this study were found to be low in both alfalfa and cotton.

References

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- Stern, V. M., R. van den Bosch, T. F. Leigh, O. D. McCutcheon, W. R. Sallee, C. E. Houston and M. J. Garber. 1967. Lygus control by strip cutting alfalfa. Univ. Calif. Agric. Ext. Serv. AXT-241. 13 pp.