

LYGUS IN THE WESTERN LANDSCAPE – CALIFORNIA

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CALIFORNIA LANDSCAPES IN WHICH LYGUS ARE IMPORTANT: Lygus bugs are ubiquitous insects occurring statewide in a diversity of habitats and under a variety of environmental conditions. Lygus prefer young buds or growing tips (meristem) of plants and population buildup tends to follow such plant development. Irrigated agriculture provides an excellent habitat for lygus bugs, however they are commonly found on desert vegetation, in foothill areas, abandoned fields and riparian habitats, particularly during the rainy season. While economic injury does not occur on many of these hosts, e.g. foothill areas, these are important in the overwintering and buildup of individuals which later move into sensitive agricultural crops.

WHERE DO LYGUS OVERWINTER AND IN WHAT LIFE STAGE(S): Overwintering occurs mainly as adults in a sexual diapause or arrested reproductive stage (Leigh et al. 1996). Diapause is induced by decreasing day length during the fall. Adults again become reproductive when day length decreases to less than nine hours (December) (Beards and Strong 1966). Overwintering as late instar nymphs, particularly during mild winters in parts of central and southern California, may occur in crops such as alfalfa.

HOW MANY GENERATIONS OCCUR: As with other insects, the number of generations per year is dependent on degree-day accumulations and to a lesser extent on host plant. The mean generation time is listed as 767 (F) DD (Champlain and Butler 1967) (laboratory study) to 799 (F) DD (Pickel et al. 1990) (field study). In the San Joaquin Valley, lygus have 5-7 generations per year on a perennial crop such as alfalfa (Leigh et al. 1996). Alfalfa is the habitat most likely to maximize the number of generations (Leigh et al. 1996). Other crops, such as cotton, may produce up to three generations per year.

WHAT ARE THE KEY CROPS AND PLANTS IMPORTANT IN LYGUS

DEVELOPMENT: The single most important crop is alfalfa (Stern 1969). Alfalfa constitutes a major overwintering site as well as a location for the early spring buildup of lygus populations. Safflower is also an important source of lygus on the west side of the San Joaquin Valley. Winter annual vegetation growing in the foothills, particularly on the west side of the San Joaquin Valley, also constitute an important area of lygus overwintering and development. On the east side of the San Joaquin Valley, vegetation along riverbeds may remain lush late into late spring constituting an area of lygus buildup. Likewise, weeds growing along roadsides, ditch banks and open fields also serve as overwintering sites and constitute locations for early season lygus buildup. In addition, cover crops in grapes and deciduous fruits and nut crops serve as important sites of lygus development.

WHAT ROLE AND IMPORTANCE DO NON-ECONOMICALLY SUSCEPTIBLE

HOSTS PLAY IN LYGUS BUILDUP: A wide variety of winter annual weed hosts are of great importance to lygus buildup, particularly on the west side of the San Joaquin Valley. As a prime

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overwintering site, early buildup occurs on these plants. Lygus overwinter in such areas, begin development in late winter and early spring and then as the winter annuals dry down in the spring, huge migrations enter the agricultural areas on the valley floor.

HOW DOES THE POPULATION GENERALLY BUILD IN YOUR AREA: On either overwintering annual vegetation, most commonly in the foothills of the western San Joaquin Valley, or in alfalfa. As the annuals dry up in the spring, lygus move to other hosts, many of which are in irrigated agriculture. Safflower constitutes an agricultural crop of significant importance for lygus buildup during the spring. Lygus move from the winter annuals to safflower as the winter annuals dry down. Later in the season, as safflower dries, lygus move out into other susceptible crops. Lygus continue to build up on alfalfa throughout the spring and summer and with each cutting migrate to adjacent susceptible crops such as cotton, beans, strawberries and a host of other species.

WHAT ARE THE SUSCEPTIBLE CROPS: Goodell (1998) notes that *Lygus hesperus* has been reported from 110 hosts while *L. lineolaris* has been reported from 328 host plants. In California, the host list for *Lygus* spp. is extensive. Many of the states 250 crops are hosts for lygus bugs and in addition, many weed species serve as hosts as well. Of the 54 crops covered by the UC IPM Pest Management Guidelines, 10 list a discussion of and control recommendations for lygus bugs. Some crops such as carrots, onions or lettuce, although a host for lygus, do not sustain economic injury when grown as a food crop. These same crops, when grown for seed, are severely injured by lygus feeding.

REFERENCES CITED:

Beards, G. W. and F. E. Strong. 1966. Photoperiod in relation to diapause in *Lygus hesperus* Knight. *Hilgardia*. 37: 345-362.

Champlain, R. A. and G. D. Butler, Jr. 1967. Temperature effects on development of the egg and nymphal states of *Lygus hesperus* (Hemiptera: Miridae). *Ann. Entomol. Soc. Amer.* 60: 519-521.

Goodell, P. G. 1998. Biology, ecology and host plants of *Lygus lineolaris* and *Lygus hesperus*. *Proc. Beltwide Cotton Conf. Memphis, TN. National Cotton Council of America.* V. 2 p. 949-950.

Leigh, T. F., S. H. Roach, and T. F. Watson. 1996. Biology and ecology of important insects and mite pests of cotton. *In* E. C. King, J. R. Phillips, and R. J. Coleman [eds.]. *Cotton insects and mites: Characterization and management.* Number Three. The Cotton Foundation Reference Book Series. The Cotton Foundation, Memphis TN.

Pickel, C., N. C. Welch, and B. D. Walsh. 1990. Timing Lygus sprays using degree-days in central coast strawberries. Santa Cruz County Agricultural Extension Leaflet. University of California.

Stern, V. M. 1969. Interplanting alfalfa in cotton to control lygus bugs and other insect pests. p. 55-69. *Proc. Tall Timbers Conf. No. 1. Tallahassee, FL.*