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**FIRST RECORD OF THE SOYBEAN APHID, *APHIS GLYCINES*
(HEMIPTERA: STERNORRHYNCHA: APHIDIDAE) IN CONNECTICUT
AND MASSACHUSETTS**Claire E. Rutledge¹**ABSTRACT**

The soybean aphid, *Aphis glycines* Matsumara, was first found in the United States in Wisconsin in the summer of 2000. Since that time it has spread to 21 states, primarily in the upper Midwest and 3 Canadian provinces. The predicted range of soybean aphid includes all of New England, but it had not yet been reported from Connecticut and Massachusetts. I surveyed two sites in each state during the summer of 2004: Hamden, CT on 4 August, Cromwell, CT on 1 September, and Plainfield, MA and Conway, MA on 10 September. Soybean aphids were present at all four sites. This is the first report of soybean aphid for Connecticut and Massachusetts.

INTRODUCTION

The soybean aphid, *Aphis glycines* Matsumara, is a pest of soybeans in Asia that has recently been introduced into North America. Soybean aphids were discovered infesting soybean fields in 5 states in the upper Midwest in the summer of 2000 (Ragsdale et al. 2004). The soybean aphid reduces yield directly via plant feeding and indirectly through virus transmission, reduction in seed protein content, and through effects on photosynthesis (D'yakonov 1975, Halbert et al. 1986, Wang et al. 1994, Macedo et al. 2003). By 2003 the aphid had been found in over 21 states and 3 Canadian provinces (Ragsdale et al. 2004). New England lies within the predicted geographical range of soybean aphid in North America (Venette and Ragsdale 2004). Before 2004, the presence of soybean aphid in Connecticut and Massachusetts had not yet been documented. Soybean is a minor crop in both states and production is limited to small-scale producers catering to the local market for edamame (fresh, edible soybean), or using soybean as a cover crop. Thus, soybean aphid is not an economic concern for producers in this region. It may, however, have importance as a vector of plant viruses for crops such as green beans or potatoes (McGraw 2002), or have ecological consequences for native aphid communities (Heimpel et al. 2004). The purpose of this study was to determine if soybean aphid had expanded its range to southern New England.

MATERIALS AND METHODS

Soybeans were sampled in 2004 for the presence of soybean aphids and associated natural enemies at four small farms, two in Connecticut and two in Massachusetts. Briefly, the sample sites were as follows:

The first Connecticut site consisted of a small soybean field (10 m x 40 m) that was being grown as a cover crop in New Haven County (41.36 N, 72.94 W). The site was initially sampled on 4 August, 2004.

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The second Connecticut site consisted of a 2 row x 20 m patch of soybeans grown for edamame, located in Middlesex County (41.61 N, 72.66 W). The site was sampled on 1 September, 2004.

The first Massachusetts site consisted of a 1 row x 5 m patch of soybeans grown for edamame located in Hampshire County (42.45 N, 72.95 W). The site was sampled on 10 September, 2004.

The second Massachusetts site consisted of a 2 row x 100 m patch of soybeans grown for edamame in Franklin County (42.51 N, 72.69 W). The site was sampled on 10 September, 2004.

At all sites, 10 soybean plants were examined visually for aphids, and three plants with aphids were taken to the laboratory. Aphids were placed in alcohol and after preliminary identification by the author were sent to David Voegtlin of the Illinois Natural History Survey for confirmation. Additional sampling was conducted to monitor aphid abundance and the presence of natural enemies at the New Haven County site. Ten randomly chosen plants were examined weekly from 28 August – 27 September 2004. The numbers of aphids and natural enemies on each plant were counted.

RESULTS

Soybean aphids were found at all sites and on all plants sampled. At the New Haven County site, aphid numbers ranged from 0 – 130 per plant (Fig. 1). Natural enemies were present at all sites, including coccinellids, predaceous dipteran larvae (Syrphidae and Chamaemyiidae), spiders, chrysopids, and predaceous bugs (*Orius insidiosus* Say, and *nabid* spp.). At the New Haven County site the anthocorid predator, *Orius insidiosus*, was the predominate predator, comprising 48% of 46 natural enemies present on sampled plants. Predaceous dipteran larvae were nearly as abundant comprising 43% of natural enemies seen (Fig. 1). I also found several mummies (Aphelinidae: Hymenoptera) in soybean aphids at the New Haven County site.

DISCUSSION

Soybean aphids were present at all four sites sampled in Connecticut and Massachusetts. Infestations were below the economic threshold for soybean aphid on soybeans in the upper Midwest (250 per plant). At none of the sites had the producers noticed soybean aphids on their plants, or any adverse impact of the aphids. Numbers of aphids per plant were higher than that found in central Indiana in summer 2004 by an order of magnitude (ca. 100 aphids per plant in CT vs. ca. 10 aphids per plant in IN) (HJS Yoo, personal communication). Populations of soybean aphid fluctuate dramatically from year to year in the Midwest (Rutledge et al. 2004), and future monitoring will be required to determine if similar patterns are found in New England. One of the primary (over wintering) hosts of soybean aphid, common Buckthorn, *Rhamnus cathartica* L., is found in both Connecticut and Massachusetts (USDA, NRCS. 2004), but it is not yet known if soybean aphid overwinters in New England. The aphids may disperse annually on prevailing winds from the Midwest. All sites sampled had natural enemies of soybean aphid present. At the New Haven County site, the number and community of natural enemies were similar to those found in Indiana (Rutledge et al. 2004).

Connecticut and Massachusetts are within the predicted geographical range of the soybean aphid (Venette and Ragsdale 2004). The aphid was found in two New York state counties that adjoin Connecticut and Massachusetts as early as 2001 (Losey et al. 2002). Therefore, it is not surprising that soybean aphid has expanded its range to include Connecticut and Massachusetts. It is likely that soybean aphid has been present in these two states prior to summer

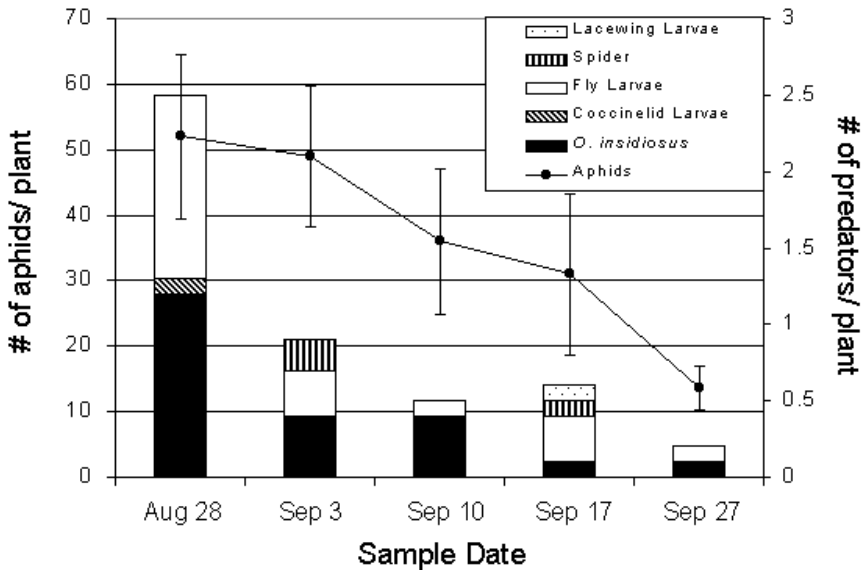


Figure 1. Soybean aphid abundance per plant (\pm SE), and predator number per plant for a 10-plant sample at the New Haven County site, late summer 2004.

2004, and was unnoticed until recently. The ability of soybean aphid to locate the small patches of soybeans that are present in the two states is noteworthy. With the exception of the New Haven County site, all of the soybean patches in which I located the aphid were well under 0.1 ha in size. In addition these sites were on small farms (< 16 ha, the New Haven County site is 29.5 ha) that were not adjacent to other farms, and were situated in woodlands.

Future monitoring of soybean aphid in Connecticut and Massachusetts will be needed to determine if the aphid is over wintering in New England, and to determine if this invasive insect is impacting agricultural or natural communities.

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