Letter to the Editor

Economic Injury Level of Soybean Aphid, Plant Developmental Stage, and Predation


Dear Editor:

I followed with interest the recent debate surrounding the article published in Agronomy Journal in 2009 by Catangui et al., “Soybean Aphid Population Dynamics, Soybean Yield Loss, and Development of Stage-Specific Economic Injury Levels.” In this article, the authors provided variable economy injury levels (EIL) for soybean aphid (Aphis glycines Matsumura) as a function of the phenological stage of soybean. The values proposed by the authors were exclusively derived from cage studies, and as such valid only under specific conditions where aphid populations are left unchecked, for example, no predation or emigration.

In their vigorous response to the above article, O’Neal and 10 co-authors (O’Neal et al., 2010) correctly pointed out that the high populations observed by Catangui et al. are rarely observed in nature, in large part due to regulation of soybean aphids by generalist predators, and appropriately cited many peer-reviewed articles to support their view. A less convincing argument was made (and no directly relevant study provided) that cage environments yield high aphid populations because they prevent emigration from crowded plants. In fact, several studies reveal that the proportion of winged individuals in cage environment is low unless the density of aphids greatly exceeds the economic threshold of 250 aphids per plant (Rhainds et al., 2007; Costamagna et al., 2007; Donaldson et al., 2007).

O’Neal and his colleagues further state cage studies cannot form the basis of EIL for soybean aphid. While I agree that it would be irresponsible to implement EIL strictly based on cage studies, I contend that it is equally irresponsible to unconditionally disregard such studies. Cage studies provide useful information on the feeding damage caused by many arthropod pests of soybean (Smith and Bass, 1972; Ogunlana and Pedigo, 1974; McPherson et al., 1979; Rowan et al., 1993; Yeargan et al., 1994; Ogunlana and Pedigo, 1974; Smith and Bass, 1972; Costamagna et al., 2007; Catangui et al., 2009). Whether or not O’Neal and his colleagues disagree with these peer-reviewed studies, and specifically with the finding that aphid infestation has the real impact on yield when soybean is in the vegetative stage, was corroborated in another cage study by Catangui et al. (2009), was corroborated in other studies excluding predators (Rhainds et al., 2007). They found that timing of infestation by aphids on soybeans had no impact on soybean yield when predators are present. O’Neal et al., and highlight the need to assess aphid density and predator density in future EIL for soybeans.

REFERENCES


