Efficiency and side effects of three neonicotinoid insecticides used as faba bean seed treatments for controlling cowpea aphid

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Abstract:

Abstract Field and laboratory studies were conducted at 2014 on the Experimental Farm and laboratories of Faculty of Agriculture, Assiut University, Egypt to evaluate the protective ability of three neonicotinoid insecticides as seed treatment (acetamiprid, imidacloprid, and thiamethoxam) against aphid damage in faba bean. In addition, we investigated the neonicotinoid side effects on the yeast, Saccharomyces cerevisiae and mycorrhizal fungus; Glomus mosseae populations associated with faba bean plants relevant their growth. The neonicotinoid treatments significantly protected faba bean plants against cowpea aphid infestation for 48 days after planting, the protective ratios with imidacloprid, acetamiprid and thiamethoxam were 87.67, 54.08 and 81.05 %, respectively. On the other hand, negative effects were observed toward soil yeast, S. cerevisiae and G. mosseae populations, showing significant decrease in the numbers of these microorganisms in all treatments after 15 days from sowing. Moreover, these adverse effects extended to other 30 days in acetamiprid and imidacloripid treatments. The negative effects reduced the nodulations as well as shoot and the root weights of treated faba bean plants till 30-days from sowing. Side effects of the tested neonicotinoids were varied and thiamethoxam showed the least severe adverse effect. These neonicotinoid treatments affected faba bean seed yield, which significantly increased as compared with the untreated control.

Keywords:

Neonicotinoid seed treatment, aphids, soil yeasts, nodulation, faba bean growth.

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