Control of aphids (Aphis fabae and Myzus persicae) on organic artichokes (Cynara scolymus L.)

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Background

On organic artichokes grown as annual crops in Central European climates large numbers of aphids (Aphis fabae and Myzus persicae) may cause severe damages to plant leaves and edible parts. We tested the effect of cultivar choice and three different organic pesticides on leaf aphid infestation and bud yield in two field trials.

Field trial design

Site: Wiesengut experimental station (Hennef/Sieg, Germany)
MAT: 10.3 °C
annual precipitation: 840 mm
soil type: loamy sand

Trial A: 4 cultivars tested
Trials B: 3 org. pesticides tested
cultivar: Imperial Star

Planting density: 0.8 x 1.2 m
Fertilization: 30 t ha⁻¹ farmyard manure
Water control: Hand-hoeing
Harvest period: 2 JUL – 30 AUG 2009
Water supply: Drip irrigation
Field replications: 4

Cultivar effects (Trial A)

Naturally occurring aphid infestation was generally low (less than 10 individuals/leaf before 16 June 2009; data not shown). On 30 Jun 2009 highest total aphid population densities were recorded in ‘JW 109’ (61.3 individuals/leaf), lowest population densities were found in ‘Concerto’ (36.5 individuals/leaf). We recorded marketable bud yields between 1.89 kg m⁻² (‘Imperial Star’) and 0.80 kg m⁻² (‘Green Globe’). No correlation between leaf aphid infestation and yield was detected.

Effects of organic pesticides (Trial B)

We compared the effects of three different organic pesticides versus a control on population densities of aphids and their predators on cultivar ‘Imperial Star’. The pesticides investigated were Spruzit (4.59 g/l pyrethrins and 825.3 g/l rapeseed oil), NeemAzal-T/S (based on extracts from Azadirachta indica) and Neudosan (515 g/l green soap). Population densities of aphids were reduced after use of all three pesticides, their predators (Coccinella septempunctata and Chrysoperla carnea) were affected only by Spruzit.

Bud yields were not affected by Spruzit but significantly reduced by NeemAzal-T/S and Neudosan, probably due to pesticide damages on artichoke buds and leaves.

Conclusions

Our study indicates that cultivar choice can be an effective preventive pest management strategy in organic artichoke production. Low infestation levels of aphids can be tolerated since use of organic pesticides not necessarily results in higher bud yields, even if aphids are significantly reduced.