

Potassium nitrate application is effective in decreasing growth rate of the aphid *Schizaphis graminum* in barley

The purpose of this study was to determine the effect of KNO_3 fertilization on the resistance of barley (

Hordeum distichum

) to the greenbug

Schizaphis graminum

. Eighteen-day-old seedlings of two barley cultivars (cv F. Unión, a cultivar without gramine and cv MCU-34 with natural gramine) were irrigated with nutrient solutions differing in KNO_3 concentrations. These seedlings were infested with adult aphids and placed in a growth chamber. Five days later the aphids were counted. In both cultivars the infestation levels reached were inversely proportional to KNO_3 supply. The population growth rate of the greenbug

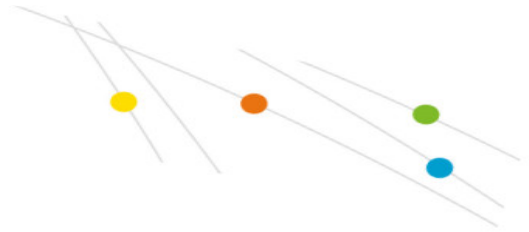
Schizaphis graminum

decreased in barley seedlings watered with nutrient solutions containing 30 mM or more nitrate.

Nitrate accumulated more in the first leaf than in the second of these seedlings as a function of nitrate fertilization. The concentration of gramine, an insect resistance factor in barley, increased in the second leaf (youngest), and decreased in the first one (oldest) with increasing NO_3^- in the nutrient solution. The feeding behaviour of aphids was negatively affected by KNO_3 in artificial diets and in the plants. The survival of aphid nymphs of

S. graminum

fed with potassium nitrate decreased with increasing KNO_3 concentrations (Figure 1) after 24 hours ($\text{LD}_{50} = 200 \text{ mM}$). It is suggested that nitrate fertilization may affect



aphid performance on barley seedlings because it causes changes in gramine concentration in the leaves.

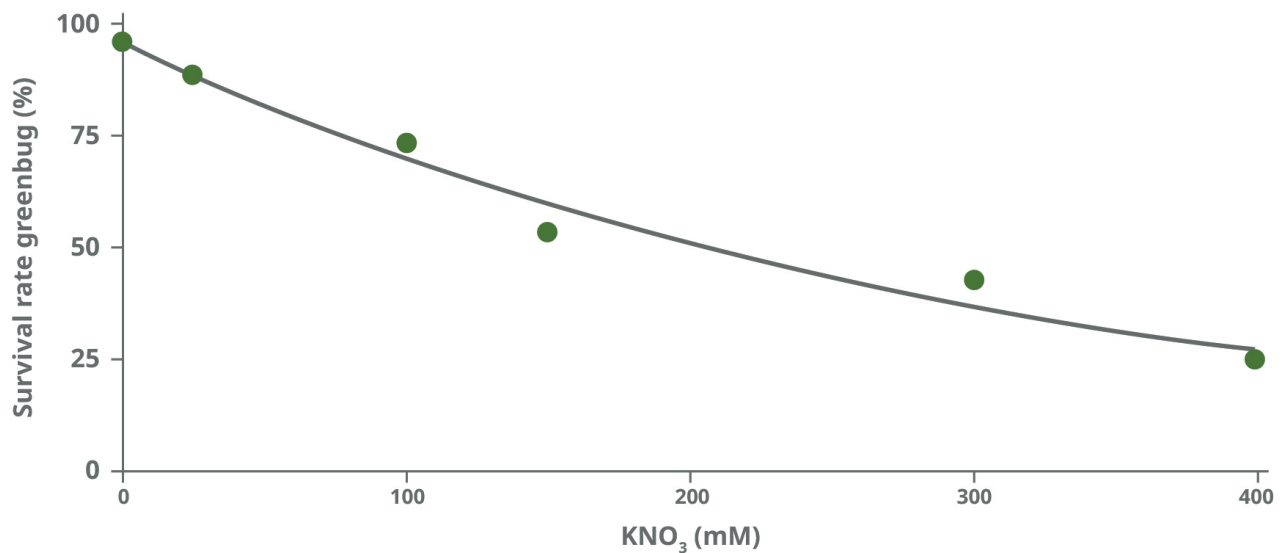


Figure 1. Effect of KNO₃ on survival rate of the aphid *Schizaphis graminum* fed with artificial diets. Each point is the mean of five samples of 10 nymphs each.