**Effect of barley-legume intercrop & major nutrients on disease in an organic farming system**

*J.T. Kinane and M.L. Lyngkjaer*
*Risoe National Laboratory, Resistance Biology Programme, P.O. Box 49, 4000 Roskilde, Denmark. Email: julia.kinane[at]risoe.dk*

The effect of barley-legume intercrop in an organic farming system on disease incidence was investigated over two years. Two barley varieties were intercropped with lupin, faba bean or pea. Several diseases were observed: ascochyta blight (*Mycosphaerella pinodes*) on pea, brown leaf spot on lupin and chocolate spot (*Botrytis*) on bean. On barley net blotch (*Pyrenophora teres*), brown rust (*Puccinia hordei*) and powdery mildew (*Blumeria graminis* f. sp. *hordei*) (in order of incidence) were detected. A general reduction in disease was observed in all intercrop systems compared to the corresponding monocrop, but the reduction was only statistically significant in the cases of brown leaf spot on lupin, ascochyta blight on pea and net blotch on barley.
The above monocrop and intercrop systems were also grown with 50 kg N added as urea and monitored under the same field conditions. While the effects of the intercrop on disease were similar regardless of nitrogen application, the presence of added nitrogen increased disease levels. Subsequently glasshouse experiments on the effect of the availability of N, P or K disease resistance mechanisms were set up. Barley was grown under different nutrient conditions (minus N, P or K). Plants were infected with powdery mildew at the third leaf stage. Initial results showed that plants depleted of nitrogen had increased resistance to the fungus (effective at penetration). Absence of phosphorous appeared to increase penetration of powdery mildew but the resulting colonies were smaller than control. Depletion of K appeared to increase fungal penetration.

Preferred topic area: Disease Management/Cultural Control