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Is ‘durum wheat - winter pea intercropping’ efficient to reduce pests and diseases?

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Aim of our study:

- Stems and leaves more attacked than pods
- Fungicide treatment reduced Ascochyta attack only in IC
- Efficiency of the fungicide in IC is increased because of the reduction of pea DM?

Conclusions:

- No nodulation in IC and only in IC
- Nodulation not affected by IC
- % of nodules drilled high and not reduced in IC
- IC was not efficient against weevils
- Great mobility of weevils?

Materials and methods:

- An experiment was carried out in Auzeville (SW France) in 2006-2007 on a clay loamy soil. The two species were sown on November 2006. The experiment was based on a split-split-plot design with 2 replicates.

Objectives:

- Pests and diseases are often a major concern, particularly in low inputs systems where no or few pesticide treatments are performed.
- Intercropping (IC) can allow a significant reduction in harmful insects and diseases compared to sole cropping (SC) (e.g. Kinane and Lyngkjaer, 2002).
- No reference on winter crops IC was available, despite winter crops seem more adapted to Southern Europe conditions.
- Aim of our study: Evaluate the assumption that Durum wheat – Winter pea intercropping (IC) is more efficient than sole crops (SC) for their ability to reduce pests and diseases by:
  i) Comparing dynamics of green aphids and weevils (two main pea pests) between SC & IC
  ii) Analysing the development of pea ascochyta (Mycosphaerella pinodes) and main durum wheat foliar diseases between SC & IC

Results:

- Pests and diseases were never increased in IC but sometimes reduced (ie Pea aphids and Pea ascochyta with fungicide protection)
- Efficiency of ‘Durum wheat - Winter pea intercropping’ to reduce pests and diseases depends on:
  i) Insect behaviour, particularly both its mobility and ability to recognize its target in a mixed cover
  ii) Disease dispersion which is in interaction with microclimate modification in intercrop
  iii) Interactions with plant architecture and farming practices, for example the ‘umbrella’ effect

- An experiment was carried out in Auzeville (SW France) in 2006-2007 on a clay loamy soil. The two species were sown on November 2006 the 9th in row-intercropping. The experiment was based on a split-split-plot design with 2 replicates.
- Three main treatments were compared:
  i) W-SC: Durum wheat (cv. Néodur sown at 280 seeds/m²) ;
  ii) P-SC: Winter pea (cv. Lucy sown at 60 seeds/m²) ;
  iii) IC: Durum wheat-winter pea IC, each specie sown at half of SC density
- Two fertiliser-N sub-treatments: i) N0: No fertilizer and ii) N1: 140 kg N/ha
- Two fungicid management: i) NT: No fungicide and ii) T: 2 applications of metaconazole (90 g.ha⁻¹)
- Measurements made: i) Evolution of pea aphids population ; ii) Number of nodules on pea roots and percentage of nodules drilled ; iii) Attack of ascochyta on stem, leaves and pods of pea and iv) Attack of mildew, brown rust, fusarium and septoria on durum wheat leaves

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Summary: Durum wheat - Winter Pea intercropping reduced aphids but not weevils perhaps because of differences in insects mobility

Durum Wheat - Winter Pea intercropping seems not efficient to reduce wheat fungi diseases but efficient against pea ascochyta