

## Trends about alfalfa resistance to the pea aphid in France

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The pea aphid (PA), *Acyrtosiphon pisum* (Harris) is the main aphid pest of alfalfa in France, as well as in Europe. Well known in forage production, PA populations recently increased on alfalfa grown for seed production. As European studies were scarce, studies were conducted in our lab about plant resistance, to get more information about alfalfa resistance for French plant breeders. As a preliminary work, the standard test of Berberet & al (1991) was adapted under controlled conditions (20°C, 16L/8D). Alfalfa seedlings were infested twice in a test with a PA controlled biomass (150 mg per unit of 50 seedlings) multiplied on alfalfa shoots. Dead seedlings were recorded two weeks after the end of the aphid infestation (13 days long). Three classes were defined: susceptible (less than one third of seedling survival), resistant (over two thirds surviving), and intermediate. All the French cultivars we tested were susceptible, except Cinna cv which was intermediate. CUF 101 was a check resistant cv. Applied to an experimental susceptible population, the test led to an increase of resistance to the fourth generation of selection. We noticed variations of ranking of some resistant US cv which are probably relevant to variability between PA populations from U.S.A. to France. The performance of CUF 101 was tested against different PA populations collected from alfalfa fields of three regions of France (East, South, Central west) during different seasons (spring and autumn) or years. PA individuals were characterized using allozymes (four loci: *SDH*, *IDH*, *PEP-LGG*, *PEP-GL*). We observed in less than 3 p100 of the tests a decrease in CUF 101 resistance which led to the intermediate level of resistance. Thus, French pea aphid populations present a low ability to overcome alfalfa resistance. At last, a 6-parent diallel crossing design including three resistant parents, two susceptible parents and one intermediate gave a significant general combining ability and proved additive inheritance.

### References

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