

### **13<sup>th</sup> NorBaRAG meeting, Online 2022; Subgroup insecticide resistance.**

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In the Nordic and Baltic regions, it is limited how many problems there are with pest insects in the field on a large scale. Our relatively cool climate does not encourage large quantities of insect pests, control of insect pests in fields is not something that happens at very high frequencies, and insecticide treatments are rarely repeated.

The main field crop in our region with potential insect pest problems is winter oil seed rape (WOSR) or spring oil seed rape (SOSR). The pollen beetle *Meligethes aeneus* is a common pest to both WOSR and SOSR in the whole region. Various other insect pests are encountered in different densities: *Psylliodes* and *Phyllotreta* flea beetles, several *Ceutorhynchus* species and the gall midge *Dasineura napi*. Oil seed rape pests was in the last decade primarily controlled by various pyrethroids and neonicotinoids, but also other insecticides (indoxacarb, pymetrozine) have been available in the Nordic and Baltic countries within the last decade. However, starting 2020, a ban on pymetrozine for use in oil seed rape has been initiated by the EU. A similar ban on indoxacarb and thiacloprid is enforced from the 2022 season. In general, the decrease in available modes of action will most like cause issues with control in the coming years.

Pyrethroid resistance has been prevalent in Europe including the Nordic/Baltic region for some time since its initial appearance in the late 1990ies in Europe. Neonicotinoid resistance is not prevalent in the region yet, but indications have been made of a swift in neonicotinoid susceptibility that needs to be addressed in years to come.

In pollen beetles, the presence of insecticide resistance to pyrethroids and neonicotinoids has been systematically survey primarily by companies with products on the market, but in most cases in collaboration with national research institutes or universities. The initial high level of pyrethroid resistance from the last decade in the Nordic and Baltic countries has been decreasing in recent years for the general pyrethroid  $\lambda$ -cyhalothrin and even more for  $\tau$ -fluvalinate.

In 2021, a few samples of cabbage stem flea beetle (*Psylliodes chrysocephala*, CSFB) were tested against the pyrethroid  $\lambda$ -cyhalothrin. In recent years control failures against CSFB have occurred in Germany and UK presumably caused by a knock-down resistance (kdr) mutation and metabolic resistance. The trials on CSFB indicate that  $\lambda$ -cyhalothrin is still effective. However, monitoring will continue in the coming years.

In recent years,  $\lambda$ -cyhalothrin monitoring efforts for the white clover seed weevil (*Protapion fulvipes*) and the clover head weevil (*Hypera meles*) has been initiated in Denmark. The white clover seed weevil and the Clover head weevil are the main pests in white clover and seed yield losses of 40% have been reported. Currently,  $\lambda$ -cyhalothrin, deltamethrin and acetamiprid are approved for use in white clover fields which leaves limited options for effective resistance management. Resistance to  $\lambda$ -cyhalothrin seemed wide-spread. However, monitoring efforts will continue in the coming years.