

*Master- and Bachelor Thesis Topics*  
Master-/bachelor-oppgaver

# Plant protection

## Plantevern

Her er mange forslag til spennende oppgaver innen plantevern, d.v.s. ugras/herbologi, plantepatologi, landbruksentomologi og pesticidkjemi. Dersom du vil finne ut mer om oppgavene ta kontakt med veilederen(e) som er oppført, med kopi til faggrupelederen i Plantevern og Matplanter [siv.remberg@nmbu.no](mailto:siv.remberg@nmbu.no). Du kan også komme med eget forslag til oppgaver.

Below you will find many interesting thesis topics in plant protection, including weed science, plant pathology, agricultural entomology and pesticide science. If you want to know more about a topic, contact the supervisor listed for the topic, and copy to the head of section [siv.remberg@nmbu.no](mailto:siv.remberg@nmbu.no). You can also suggest a topic that is not listed here.

# **Agricultural entomology**

## **Landbruksentomologi**

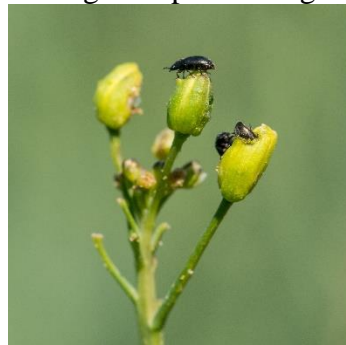
## Insecticide resistance monitoring and management

**Supervisor:** Nina Svae Johansen, NIBIO/NMBU. [nina.johansen@nibio.no](mailto:nina.johansen@nibio.no)

**Background:** Pesticide has become an increasing problem in Norwegian agriculture. Insect and mite pests of concern are the e.g. pollen beetles (*Brassicogethes/ Meligethes* spp.) and flea beetles in oilseed crops, diamondback moth (*Plutella xylostella*) in cruciferous crops and two-spotted spider mite (*Tetranychus urticae*) in soft fruits berry production. Some populations of these pests have developed resistance towards one or more pesticides. In order to obtain less and a more sustainable use of insecticides, and reduce the risk of resistance development, there is a need to develop resistance management strategies for use at farm and district level, and to include anti-resistance strategies in integrated pest management programs.



**Fig. 1.** Adult and egg of two-spotted spider mite (Photo: K. Westrum, NIBIO)



**Fig. 2.** Adult pollen beetles on spring rape flower buds. (Photo: E. Fløistad, NIBIO)



**Fig. 3** Larvae of diamondback moth (Photo: E. Fløistad, NIBIO).

**Thesis:** Different approaches are relevant, and a specific approach must be made based on the student's field of interests. The master thesis will be a part of the projects Pesticide resistance: Mutation, selection and dispersal (RESISTOPP) 2017-2021 or Pesticide resistance: Preparedness and anti-resistance strategies (2017-2019).

### Examples of topics are:

- Monitoring the susceptibility in one of the mentioned pests towards insecticides used for their control. The work will include collection of pests from field, resistance tests (bioassays) in laboratory and/or efficacy experiments in fields.
- Effect of the composition of the pollen beetle species-complex on resistance level: The work will include identification of pollen beetles collected from oilseed rape fields with morphological or molecular methods (beetles collected in 2016-2018 are available as well) and resistance tests (historical and/ or new data).
- Effect of resistance development on the fitness of two-spotted spider mites. The work will include resistance selection in a strain of the two spotted spider mites, and experiments to study of how resistance affects the biology of the mites. Laboratory experiments.
- Development of anti-resistance strategies for pest control in one of the crops for use at farm and district level: The work will include literature study, compilation of current knowledge on resistance management and interviews with agricultural advisors and farmers, and can be combined with one of the above-mentioned tasks.

**You will get help with the handling of insecticides.**

**Time for doing different tasks:** Field collection of pests during May-August; resistance testing with bioassays during May-December; fitness-resistance studies in laboratory and development of and anti-resistance strategies during January-December.

**Read more (in Norwegian):**

Johansen NS, Asalf B, Eikemo H, Ficke A, Herrero M, Le VH, Netland J, Ringselle B, Schjøll AF, Stensvand A, Strømeng GM (2017). Plantevernmiddelresistens hos skadegjørere i norske jord- og hagebrukskulturer. NIBIO Rapport 3 (150) 2017. 60 pp.  
<https://brage.bibsys.no/xmlui/handle/11250/2481104>

Pollen beetles: <https://www.plantevernleksikonet.no/l/oppslag/73/>

Diamondback moth: <https://www.plantevernleksikonet.no/l/oppslag/93/>

Two spotted spider mites: <https://www.plantevernleksikonet.no/l/oppslag/19/>

<b>Management of the alien invasive horse-chestnut leafminer</b> <i>Cameraria ohridella</i>
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**Supervisor:** Nina Svae Johansen, NIBIO/NMBU. [nina.johansen@nibio.no](mailto:nina.johansen@nibio.no)

**Background:** The horse-chestnut leafminer (*Cameraria ohridella*) was first described in Macedonia in 1984, it then spread rapidly across Europe. The larvae, mining in the leaves, has caused considerable damage on horse-chestnut trees since the 1980's. The horse-chestnut leaf miner was found for the first time in Drøbak in Norway in 2013, and has so far been found at several locations around Oslofjorden, including in the park at NMBU, and at one location in Vest-Agder. There is little experience on the biology and ecology of this pest in Norway, and how this pest can be managed.



**Fig. 1.** Adult horse-chestnut leaf miner



**Fig. 2.** Leaf mines made by larvae of horse-chestnut leaf miner

**Thesis:** Different approaches are relevant, and a specific approach must be made based on the student's field of interests.

**Examples of topics are:**

- Investigate current distribution of the horse-chestnut leafminer in Norway.
- At selected location(s):
  - Phenology of the horse-chestnut leafminer
  - Survey of natural enemies of the horse-chestnut leafminer at selected locations
  - Investigate winter survival of the horse-chestnut leafminer at selected locations
- Develop a guideline for prevention and management of horse-chestnut leafminer on trees in urban areas.

**Read more about the horse-chestnut leafminer:**

In Norwegian: <https://www.plantevernleksikonet.no/l/oppslag/1850/>

In English: <https://gd.eppo.int/taxon/LITHOD>