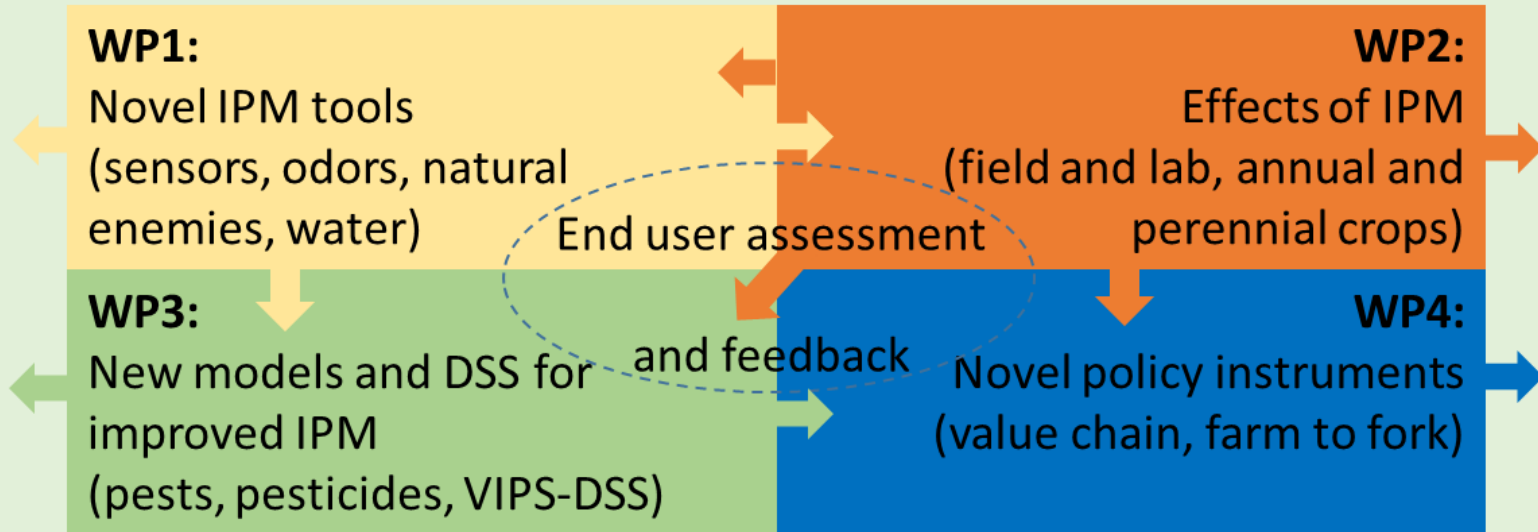


Innovative approaches and technologies
for Integrated Pest Management
to increase sustainable food production
(2015-2019)

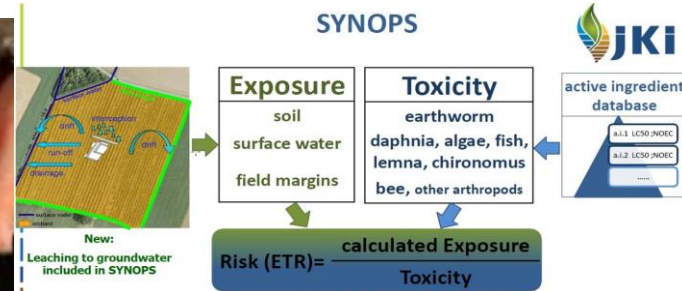
SMARTCROP WORK PACKAGES (WPS)

WP6: Co-ordination/management

WP5: Communication/dissemination
(stakeholders, end-users, international scientific exchange)



Modell crops: Barley, Wheat, Strawberry, Apple



SMARTCROP project leader and WP and Task leaders

SMARTCROP project leader: Ingeborg Klingen	WP and task leader
WP1: Innovative IPM tools	Therese With Berge
WP1.1 Sensor-based weed harrowing in cereals	Therese With Berge
WP1.2 Combine odors and natural enemies	Gunda Thöming
WP1.3 Effect of water on pests and beneficials	Arne Stensvand
WP1.4 End users continuous assessment of suitability of tools	Valborg Kvakkestad
WP2: Effect of different IPM practices	Nina Trandem
WP2.1 Field trials for demonstration & research annual crops	Therese With Berge
WP2.2 Field trials for demonstration & research perennial crops	Nina Trandem
WP2.3 Lab studies on interactions	Ingeborg Klingen
WP2.4 Assessment of IPM practices and end-users' continuous feedback	Valborg Kvakkestad
WP3: Develop and implement new models	Marianne Stenrød
WP3.1 Develop new simulation models for selected pest-pest-natural enemy complexes	Anne-Grete Roer Hjelkrem
WP3.2 Refine existing apple scab model	Arne Stensvand
WP3.3 MACRO, a pesticide fate model adapted for winter conditions	Ole Martin Eklo
WP3.4 SYNOPSIS, a web-based tool for environmental risk assessment	Marianne Stenrød
WP3.5 Implement selected models into an existing web-based forecasting system	Tor-Einar Skog
WP3.6 Involvement of end users to assess the suitability of the web-based forecasting system	Valborg Kvakkestad
WP4: Innovative policies for a persistent adoption of intensive IPM	Valborg Kvakkestad
WP4.1 Consumer, wholesaler and retailer attitudes to IPM	Anna Birgitte Milford
WP4.2 Policy instruments for increased availability of IPM tools	Valborg Kvakkestad
WP4.3 Suggestions for innovative policy measures	Arild Vatn (NMBU)
WP5: Communication with stakeholders and dissemination of results	Ingeborg Klingen
WP5.1 Participation of and communication with stakeholders and end-users	Ingeborg Klingen
WP5.2 International dissemination and exchange of personnel	Ingeborg Klingen
WP5.3 Project web-site with project activities and results	Einar Strand (NIBIO/NLR)
WP6: Project coordination	Ingeborg Klingen
WP6.1 Coordination and consortium management	Ingeborg Klingen
WP6.2 Financial management	Ingeborg Klingen
WP6.3 Annual- and final report	Ingeborg Klingen



Therese With Berge



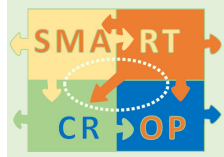
Nina Trandem



Marianne Stenrød



Valborg Kvakkestad



WP 1.2

COMBINE ODOURS AND NATURAL ENEMIES FOR PEST CONTROL

Model System: Green lacewings for control of aphids in cereals and apple

→ Use odours to attract and establish natural enemies in the agro-ecosystem



Gunda Thöming, Geir Kjølberg Knudsen, Sandor Koczor, Marco Tacin



1. USE OF VOLATILES IN THE FIELD

→ Attract lacewings and increase egg laying

Volatiles:

Methylsalicylate + Acetic acid + Phenylacetaldehyde

3 x 100 mg/dispenser

1 – 4 dispensers/100m²

Volatile-dispensers:

1) Csalomon dispenser (Hungary)

2) Volatile-paste as an alternative formulation



Centre for Agricultural Research, Ungarn
Sándor Koczor, Miklós Tóth, Zoltán Imrei



2. FLORAL BUFFER STRIPES

→ Enhance habitat and food sources of adult lacewings



Establish flowers at field edges:

Annual:

Midt-norsk blomsterengfrø,
15 flower and grass species,
native in Norway



Perennial:

Blomsterengfrø Nelson,
33 flower and grass species,
NOT all native in Norway



3. OVERWINTERING BOXES WITH ODOUR

→ Increase overwinter survival of green lacewings



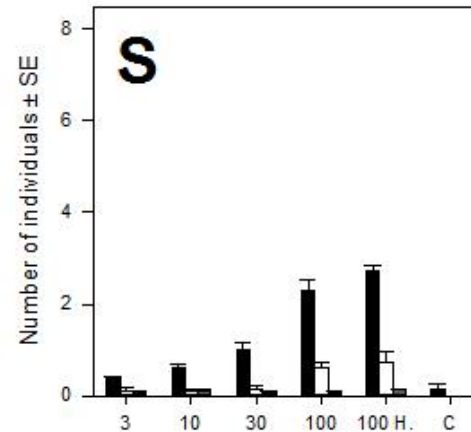
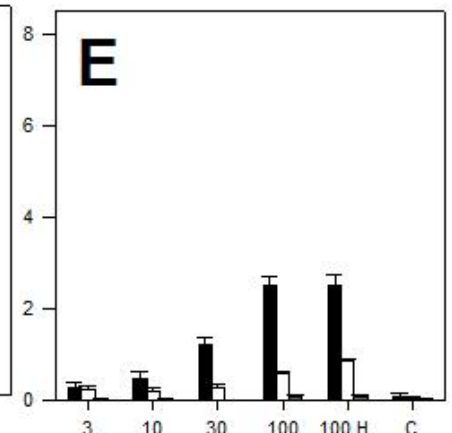
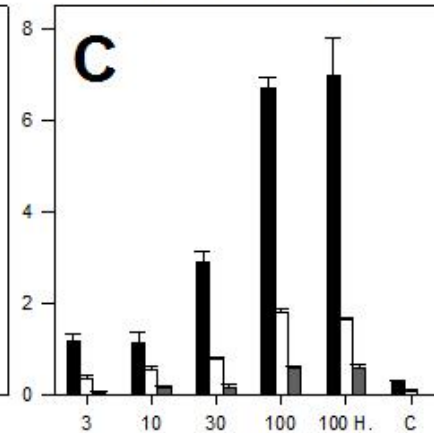
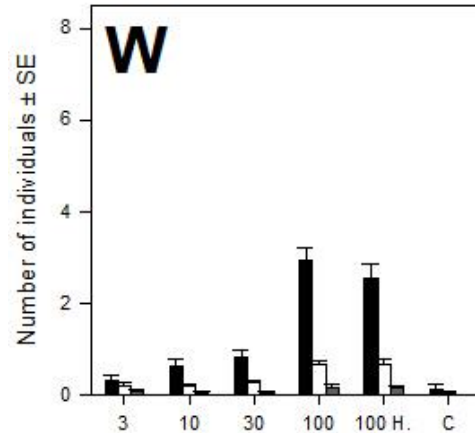
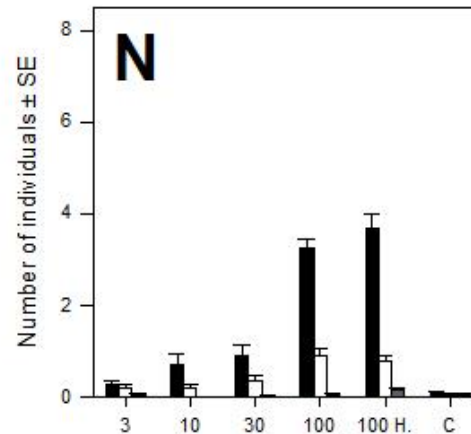
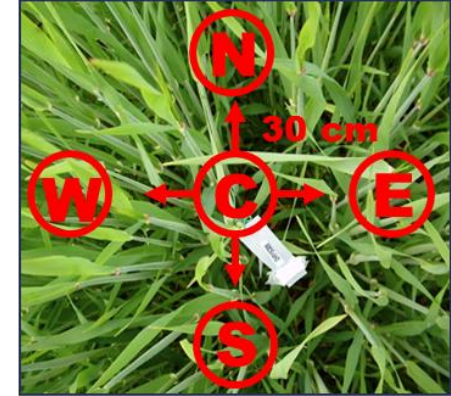
LACEWINGS IN BARLEY AS, NORWAY 2015

ODOUR:

DOSE-RESPONSE

Chrysoperla carnea
species complex

- eggs
- larvae
- adults



APHIDS IN BARLEY ÅS, NORWAY 2015

ODOUR: DOSE-RESPONSE

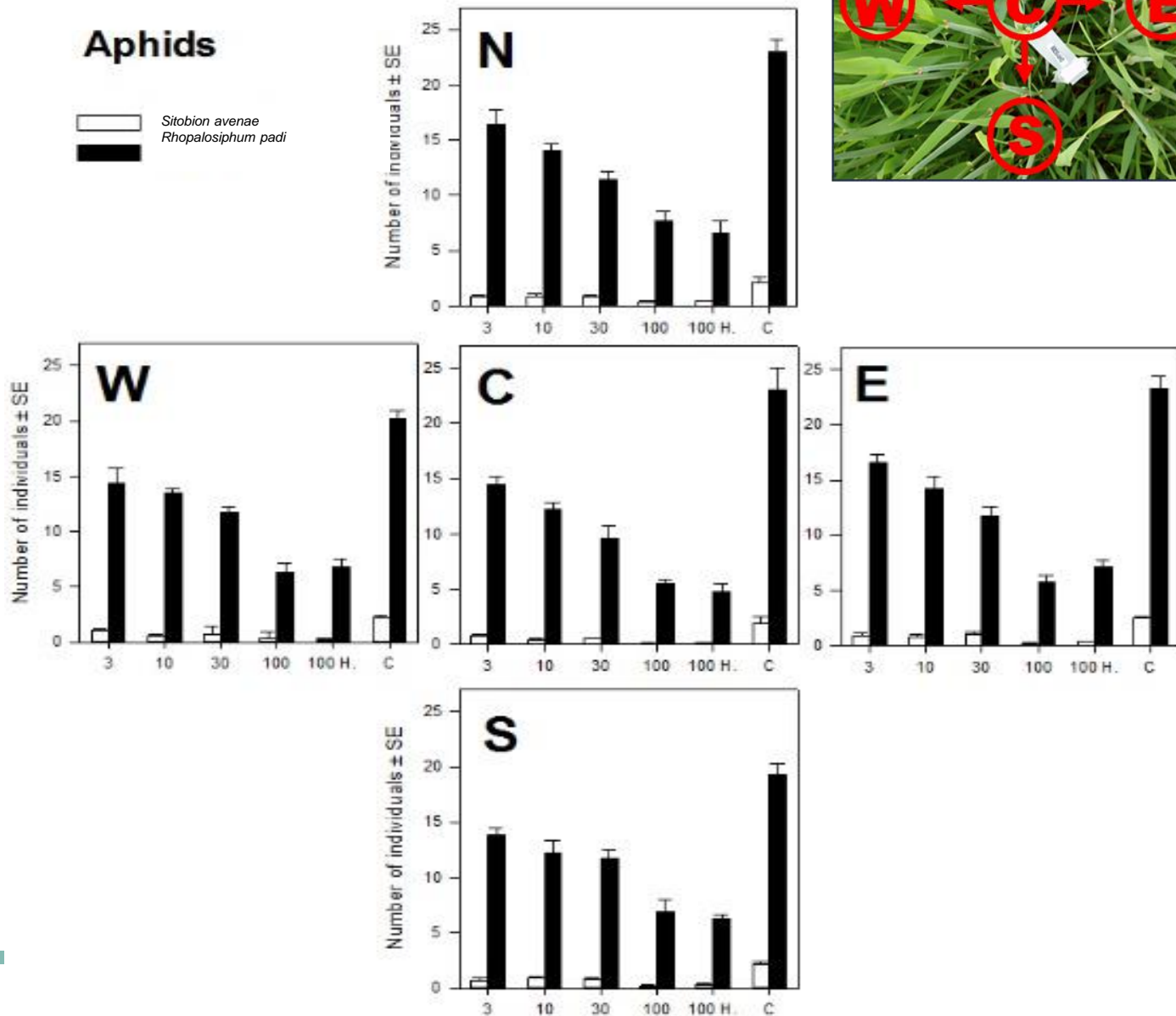
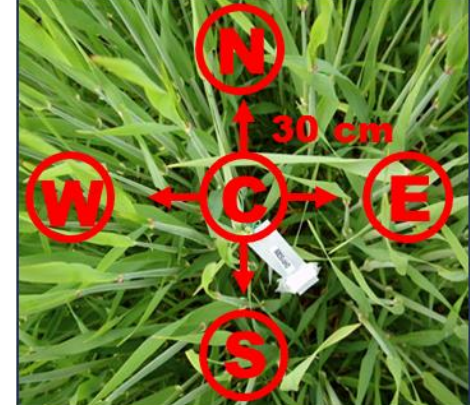
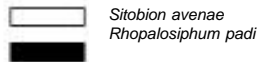


Sitobion avenae



Rhopalosiphum padi

Aphids



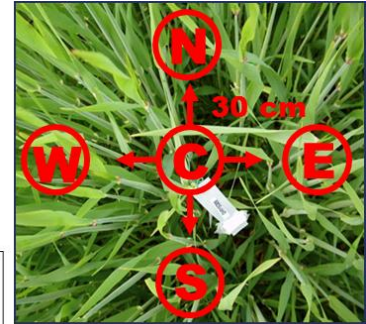
LACEWINGS IN BARLEY ÅS, NORWAY 2016

ODOUR: FORMULATION OF VOLATILES

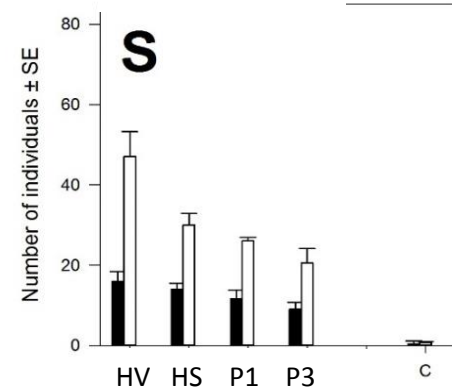
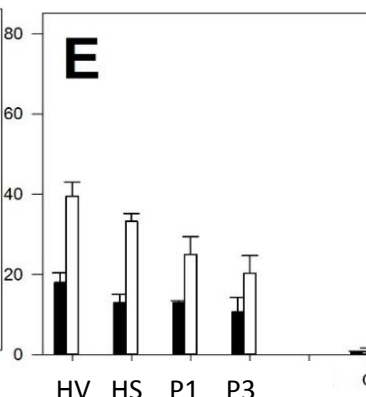
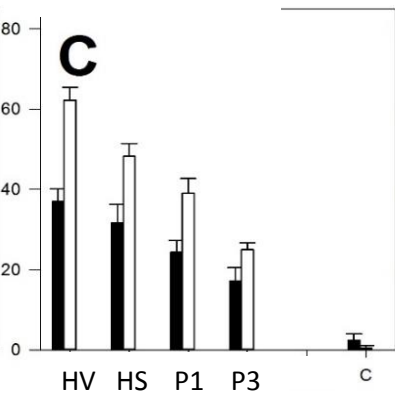
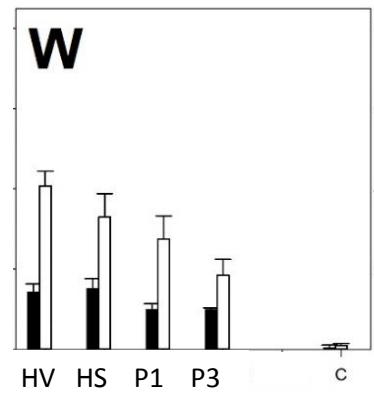
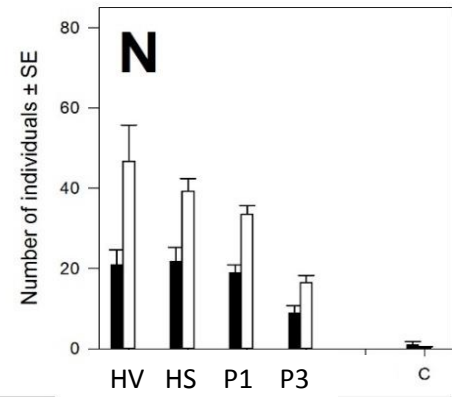


Chrysoperla carnea
species complex

■ eggs
□ larvae



- HV**= Csalomon Dispenser in vegetation height
- HS**= Csalomon Dispenser soil application
- P1**= Paste application at the plant 1x
- P3**= Paste application at the plant 3x
- C**= Control



APHIDS IN BARLEY ÅS, NORWAY 2016

ODOUR: FORMULATION OF VOLATILES



Rhopalosiphum padi

Sitobion avenae

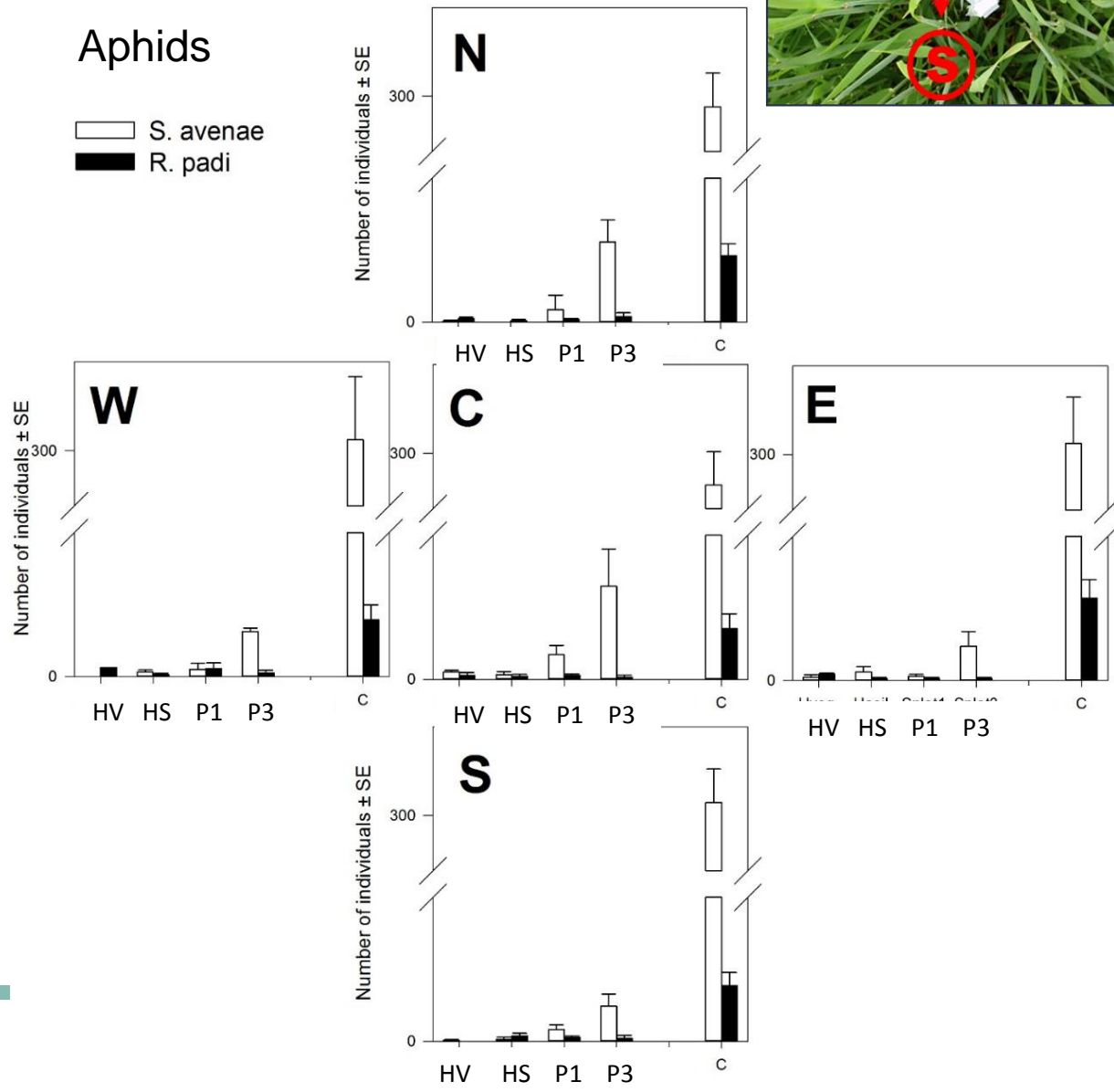
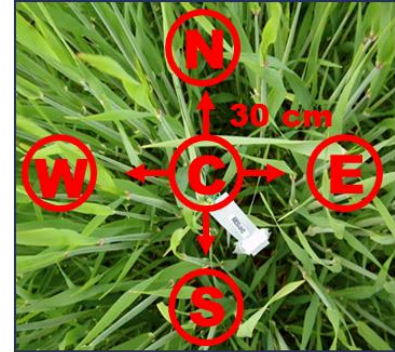
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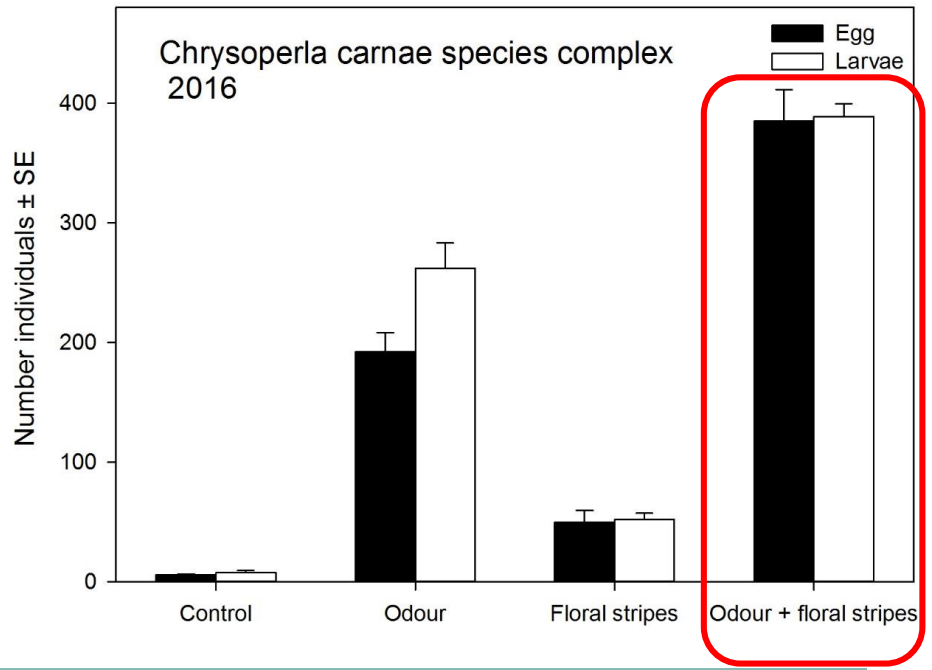
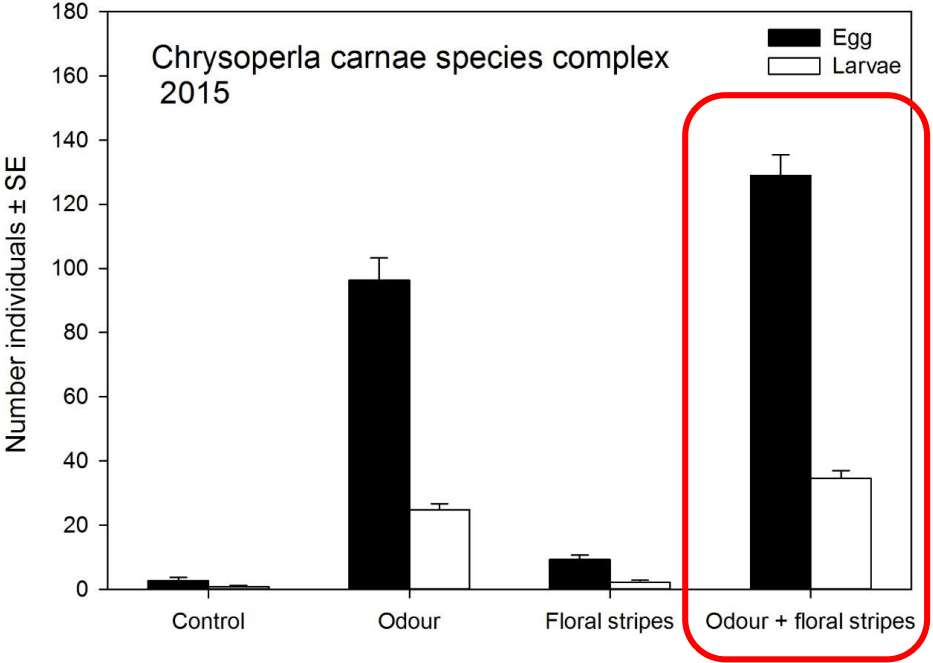
LACEWINGS IN BARLEY ÅS, NORWAY 2015 AND 2016

ODOUR + FLORAL STRIPES + OVER WINTERING BOXES

1. Year



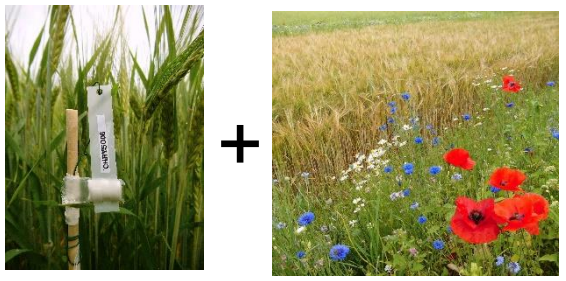
2. Year



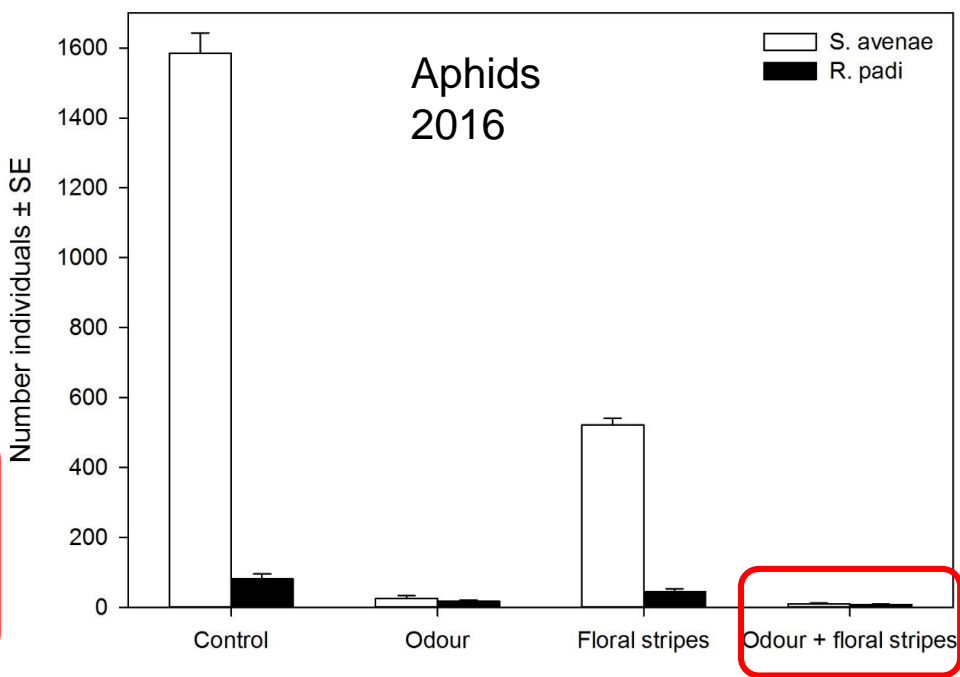
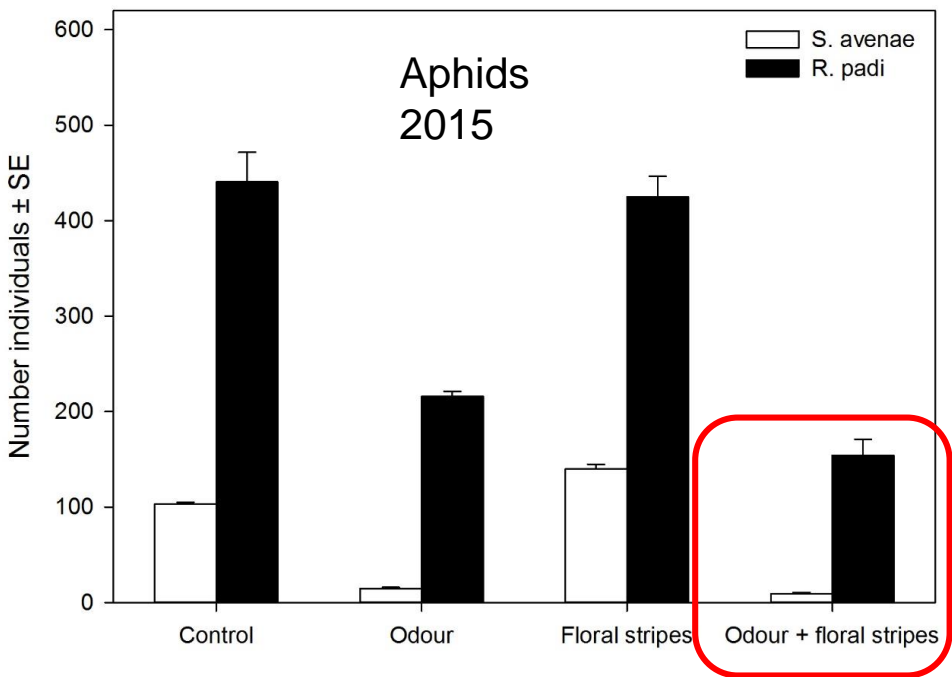
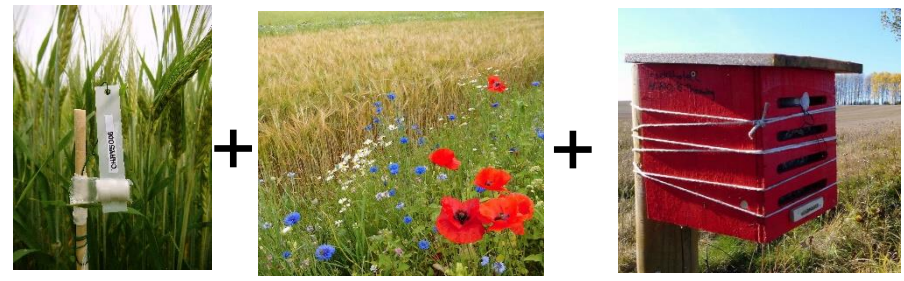
APHIDS IN BARLEY ÅS, NORWAY 2015 AND 2016

ODOUR + FLORAL STRIPES + OVER WINTERING BOXES

1. Year



2. Year





NIBIO

NORWEGIAN INSTITUTE OF
BIOECONOMY RESEARCH

THANK YOU FOR YOUR ATTENTION!

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