



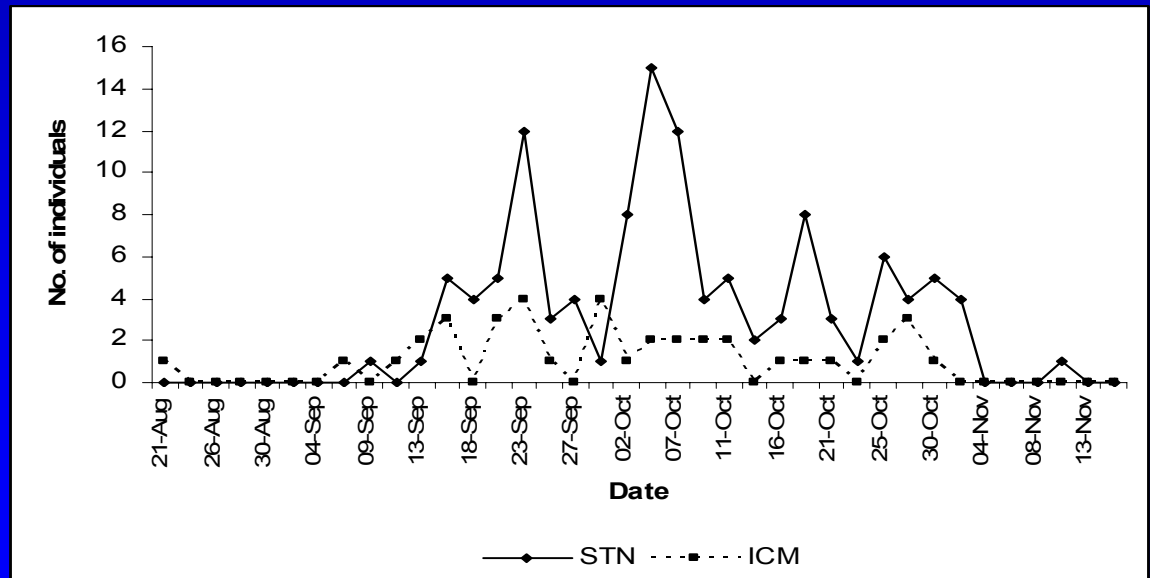
The cabbage stem
flea beetle
Psylliodes
chrysocephala

Ingrid H. Williams
Rothamsted Research

Life - history



Adult immigration



Early-sown crops most vulnerable to attack

Life-history

Eggs
laid
in
soil



Larva in leaf petiole

Pupa in soil cavity



New generation adult

Leaf characters

1st instar csfb
larvae live in
leaf petioles



- Modifying petiole structure may restrict larval entry & feeding
- Early leaf fall may kill larvae

Control

1. Chemical
2. Biological
3. Trap crops

Chemical control

- **Seed treatment**
beta-cyfluthrin + imidacloprid (Chinook)
(replaced organochlorine gamma-HCH)

• Pyrethroids



Shotholing



Economic threshold: 5 larvae per plant

Biological control

Parasitoid that attacks the adults

- *Microctonus melanopus* (Braconidae)

Parasitoid that attacks the larvae

- *Tersilochus microgaster* (Ichneumonidae)

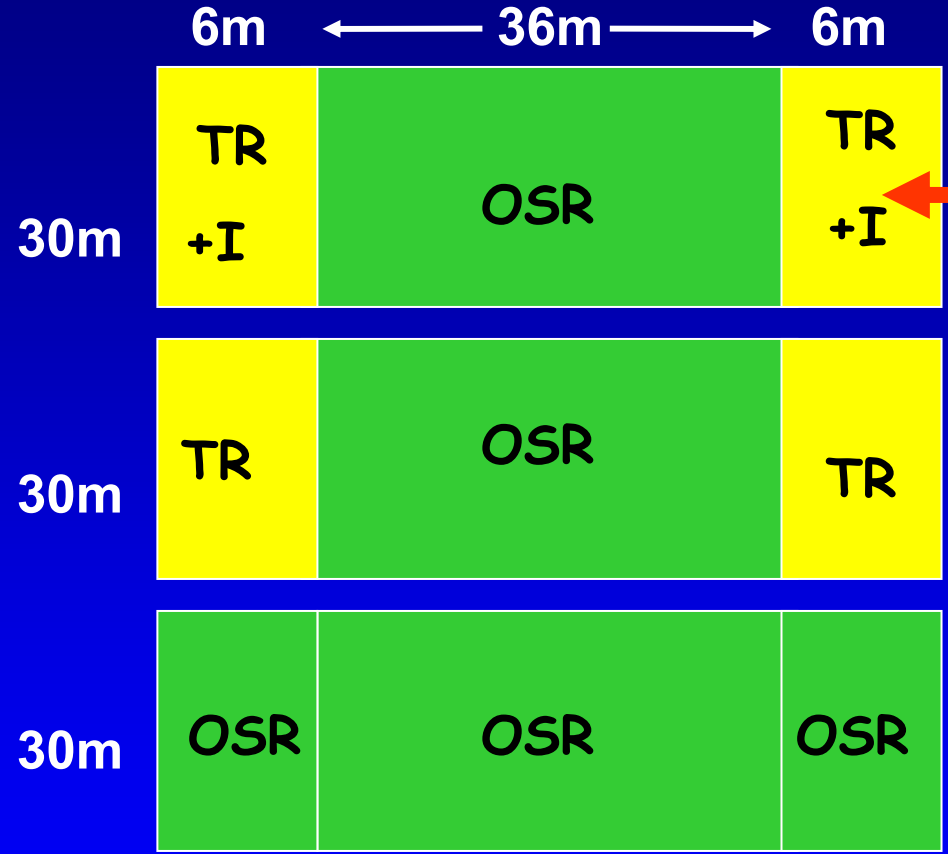
Trap crops

More attractive cultivars or species used to protect main crop from pest damage by

- Reducing pest infestation
- Concentrating pests in small part of crop
- Attracting natural enemies to the crop

Turnip rape as a trap crop

- More attractive to pests
- Develops faster and flowers earlier
- More attractive to parasitoids



Pyrethroid applied

- 1 October 01
- 15 April 02

**Plant sampled monthly
for larvae & parasitism**

Conclusion

TR has potential for use as a trap crop to protect OSR plants from flea beetles because:

- the pest was more abundant on TR than OSR
- parasitism of pest larvae greater in TR than OSR

Glucosinolates and pests

- GS are important chemical mediators of insect -plant interactions
- GS deter feeding by generalist herbivores
- GS aid crop location by specialist pests & parasitoids
- GS stimulate feeding by specialist pests

GS & host plant location

- OSR has indolyl, aromatic & alkenyl GS
- on damage GS ► isothiocyanates & nitriles
- on detecting ITC pests/parasitoids fly upwind
- different GS produce different ITC
- species differ in their response to different ITC

Glucosinolates & feeding



- Choice tests (40) ► fed only on species with GS
- Gustatory sensillae on antennae sensitive to GS
eg. glucobrassicin
- Glucobrassicin in agar stimulates feeding
- GS not a prerequisite for feeding
- Csfb will feed on agar + sugar
- Feeding stimulates production of indolyl GS

Field trials with GS lines

Increasing total GS in leaves

- ▶ more csfb feeding
- ▶ less slug/pigeon damage



The ideal GS profile for pest resistance in OSR ?

Option 1: cvs. with low constitutive GS but high inducible GS

- ▶ specialist pests could not locate crops
- ▶ generalist pests would not feed on damaged plants

The ideal GS profile for pest resistance in OSR ?

Option 2. cvs. with same total GS but higher % of indolyl GS which do not produce ITC

- ▶ deter feeding by generalists
- ▶ be less attractive to specialists (until found)

Thank-you