HOLLAND, J.M.,
OATEN, H.,
MOREBY, S.J. &
SMITH, B.M.

THE GAME CONSERVANCY TRUST

Field trials

Re-bugging the system: promoting adoption of alternative pest management strategies in field crop systems

Background

- A suite of different invertebrates contribute to biocontrol of insect pests in arable crops.
- A source of pollen and nectar can enhance populations of some pest natural enemies.
- The relative value of different types of natural enemy is poorly understood.
- Adoption of biological control is low in arable farming systems.

Aims for first year

1. Develop and test experiments to measure the level of cereal aphid predation provided by ground dispersing and airborne aphid natural enemies.
2. Consider the impact of floral field margin composition on natural enemy distribution and cereal aphid control.
3. Develop and test a technique to monitor the movement of airborne natural enemies.

Methodology

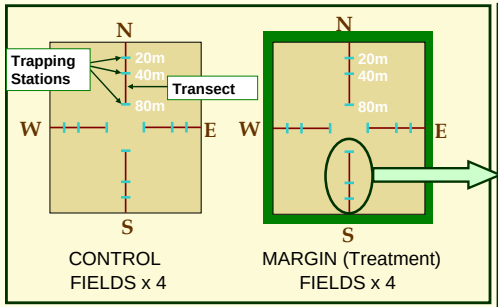
Exclusion cages were used to manipulate predator diversity and abundance at two distances (20 & 80m) from standard and flower-rich field boundaries. Each cage was infested with 500 grain aphids and their population increase monitored.

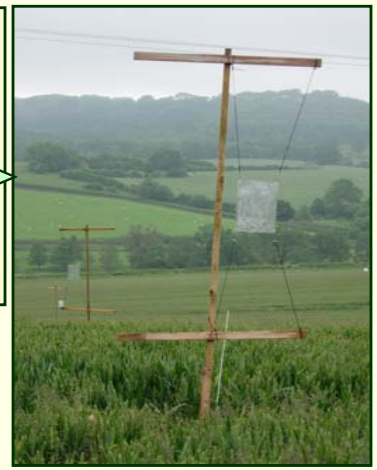
Control - no exclusion	Exclusion of flying predatory and parasitic species e.g. hoverflies & parasitoids	Exclusion of ground dispersing predators e.g. beetles	Total exclusion

Natural enemy monitoring using:
1. Sticky traps.
2. D-vac suction sampling.
3. Pitfall traps

The movement of aerially dispersing natural enemies was measured using sticky traps set up along transects in a "cross shape" within each field. This design aimed to account for the following factors:

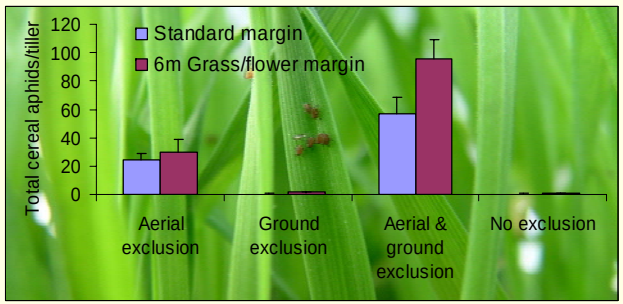
1. *Field type* – Margin vs. No Margin.
2. *Orientation* – (N, S, E and W).
3. *Distance* – (20m, 40m and 80m).
4. *Emigration and immigration* – into and out of the field.





Results

- Levels of biocontrol were the same at 20 & 80m from the field boundary.
- Cereal aphids increased 100-fold in the absence of biocontrol.
- Airborne predators were most effective at controlling cereal aphids.



- Trapping system successfully developed for sampling airborne natural enemies.
- Target aerially dispersing aphid predators were caught on both the sticky traps and in D-vac samples including:

- *Tachyporus spp.*
- *Coccinellidae*
- *Chrysopidae*
- *Syrphidae*
- *Cantharidae*

Sticky trap and D-vac sample results are currently being analysed.

RURAL ECONOMY AND LAND USE