Farm Scale Evaluations of Genetically Modified Herbicide Tolerant Crops

Explanatory notes

The Farm Scale Evaluations (FSE) were setup to determine whether genetically-modified herbicide-tolerant (GMHT) crops might have any significant effects on farmland wildlife resulting from the way the crops would be managed.

Dataset Descriptions

Data was collected for the four crops (Beet, Maize, Spring-sown Oilseed Rape and Winter-sown oilseed Rape) in the following areas:

- **Seedbank**

Seedbank counted plant species germinating from a soil sample taken before the crop was planted. Seedbank Follow-up 1 was a repeat soil sample taken one year after the initial seedbank sample. Seedbank Follow-up 2 was the final soil sample taken two years after the initial soil sample.

- **Vegetation in the crop**

First-seedling was the first vegetation survey undertaken in the crop before herbicide was applied.

In Beet Mezzanine was an additional vegetation survey in the crop done between herbicide being applied to the conventional side and herbicide being applied to the GM side. In Winter Rape Mezzanine was the vegetation survey done in the spring before any herbicide was applied.

Post-herbicide was the vegetation survey done after herbicide was applied to both conventional and GM sides.

Final Counts was the vegetation survey done at the same time as the Biomass sample was taken. Biomass sampled the weeds in the crop and was taken in the month before the crop was harvested.

Seed Rain collected plant seeds throughout the growing season of the trial crop.

Follow-up 1 was the vegetation survey done one year after the trial crop and Follow-up 2 the vegetation survey done two years after the trial crop.

- **Field edge vegetation**

Margin Attributes recorded the physical features around the edge of the trial field.

The following protocols recorded data from the field boundary, margin and verge: Edge Veg Cover recorded the cover of plant species in June. Edge Veg Flower recorded plant flowering from April to August. Edge Veg Seed recorded plant seed setting in July and August. Edge Bare Ground recorded the percent of bare ground and Edge Spray Damage recorded the amount of vegetation damaged by spraying.

- **Invertebrates**

Bee and Butterfly transects were walked in the crop and field margins monthly between April and August. Pollinators is the combined Bee and Butterfly counts.

Crop Pests counted herbivores on the crop early and late in the crop season.

Gastropod Search counted gastropods in the field margin and Gastropod Trap counted gastropods trapped in the crop in spring and autumn.

Pitfall was the count of surface-active invertebrates sampled early, mid and late in the crop season.

Vortis was the count of arthropods on plants sampled early and late in the crop season. The sampling was in the field verge and in the crop.

- **Additional tables**

Date the crops were drilled.
Herbicides applied to the crops.
Height/Cover of weeds and crop.

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Explanatory notes for data tables

Table name convention:
All tables are named and referenced using the following convention:
abbreviatedprefix_crop_(sample date)_protocol
e.g. sum_b_seedrain = summary from Beet crop for seedrain
or e.g. sum_b_early_pitfall = summary from Beet crop for early season
pitfalls

Generic table properties:
- Each row represents half-field totals (counts/biomass/mean percent cover) for a separate individual site.
- Note that group totals are given as well as individual species that contribute to these groups.
- Sites are individually referenced within Defra Government regions. Note for reasons of farmer confidentiality, South-eastern and Eastern England regions have been aggregated.
- Nulls appear where no verified data were collected.
- Some counts are shown with decimal places: these values have been calculated using only a proportion of the transects.

Specific table properties:
all crop_pest tables: name suffix of 'W +' or 'W-' = winged / wingless

Column headings:
   conv_count = conventional crop count
   conv_count_FL = conventional crop count of flowering plants
   conv_count_GE4TL = conventional crop count of >= than 4 true-leaved plants
   conv_count_L4TL = conventional crop count of < 4 true-leaved plants
   conv_count_SE = conventional crop count of seeding plants
   crop_cover = C = percent cover of crop
   crop_unit = C = conventional crop, GM = GM crop
   crop_height = height of crop in centimetres
   gm_count = GMHT crop count
   gm_count_FL = GMHT crop count of flowering plants
   gm_count_GE4TL = GMHT crop count of >= than 4 true-leaved plants
   gm_count_L4TL = GMHT crop count of < 4 true-leaved plants
   gm_count_SE = GMHT crop count of seeding plants
   name = species or group name (either scientific or common British name)

site_ref = site reference number (consistent across all tables i.e. Site 1 in Beet_Bees is the same Site 1 in Maize_Gastropod_Search)
Region = Defra Government regions or aggregates of (see note above).
VEG/ARTHROPOD/GASTROPOD/BB_BRC = Biological Records Centre code for vegetation/arthropods/gastropods/bees&butterflies
weed_cover_pc = percent cover of non-crop vegetation

- For further information on the spring crops refer to the theme issue 'The Farm Scale Evaluations of spring–sown genetically modified crops': *Phil. Trans Royal Soc.*, November 29, 2003; 358 (1439)

- For further information on the winter rape refer to:
  Bohan, D.A., Boffey, C.W.H., Brooks, D.R., Clark, S.J., Dewar, A.M., Firbank, L.G., Haughton, A.J., Hawes, C., Heard, M.S., May, M.J., Osborne, J.L., Perry, J.N., Rothery, P., Roy, D.B., Scott, R.J., Squire, G.R., Woiwod, I.P. & Champion, G.T. (2005) Effects on weed and invertebrate abundance and diversity of herbicide management in genetically modified herbicide-tolerant winter-sown oilseed rape. *Proceedings of the Royal Society Series B* **272** 463-474 (2005).

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