



Rapid weed survey at the field scale

Method/protocol submitted by:

Surname: MUNIER-JOLAIN

First name: Nicolas

Organisation: INRA – UMR 1210 Biologie et Gestion des Adventices INRA/UB/AgroSup –
Dijon - France

Email: munierj@dijon.inra.fr

Author(s) of the document:

Nicolas Munier-Jolain

Objectives of the protocol:

To estimate weed abundance from a rapid field survey.

Brief description of the protocol:

This protocol is based on a 2-way field crossing with 8 sequences to estimate weed abundances (4 sequences during the first crossing, 4 sequences during the way back). Qualitative scales are used to assess abundance and phenological stages.

Possible uses of this method/protocol:

This protocol is used for pluriannual longitudinal surveys of weed infestation in commercial fields managed with innovative cropping systems with low herbicide inputs. These fields belong to farm networks devoted to demonstration and participative research.

Protocol:

○ Observation period and frequency

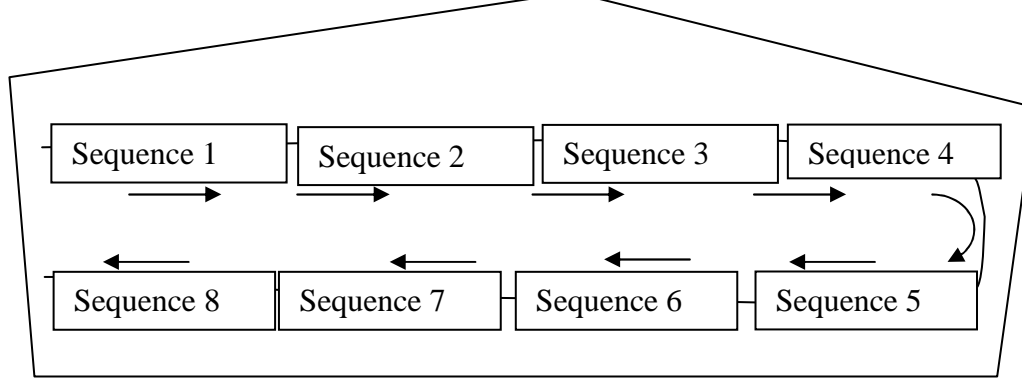
Observations are typically performed twice during the crop cycle, i.e. just before the first weed control operation (potential weed infestation), and 1-2 weeks after the last weed control operation (weed actually competing with crops).

○ Sampling

The operator walks along the crop rows in approximately the first third of the field width and the first quarter of the field length, writing down the list of identified species (all species seen by the operator), and both minimal and maximal phenological stage for each species. When reaching the first quarter of the field length, he/she writes down the dominating phenological stage and the average abundance for each species... and goes on walking for the second sequence. After the fourth sequence, when reaching the field edge, he/she moves to the second third of the field width and begins the walking back with the 5th sequence (see figure).

4 marks are thus given for each species and sequence:

- Local average abundance
- Minimal phenological stage
- Maximal phenological stage
- Dominating phenological stage



Observation path adopted by the operator in the field

○ Qualitative scales

Abundance (Barralis)

- ε : few individuals over the crossed area (less than 10)
- + : less than 0.1 plant.m⁻²
- 1 : from 0.1 to 1 plant.m⁻²
- 2 : from 1 to 3 plant.m⁻²
- 3 : from 3 to 20 plant.m⁻²
- 4 : from 20 to 50 plant.m⁻²
- 5 : from 50 to 500 plant.m⁻²
- 6 : more than 500 plant.m⁻²

Phenological stage

- | | |
|--------------------------------------|------------------------------------------|
| 1 : Cotyledons (grasses: first leaf) | 7 : Flowering (full) |
| 2 : Seedling | 8 : Flowering (ending) |
| 3 : Vegetative stage | 9 : Fruiting |
| 4 : Floral buds | 10 : Immature seeds |
| 5 : Grasses: earing | 11 : Mature seeds |
| 6 : Flowering (beginning) | 12 : Seeds disseminated, senescent plant |

Advantages / Drawbacks of the method/protocol:

The method provides a rapid assessment of the weed infestation level, precise enough to demonstrate changes in the weed community after a few years of innovative cropping system.

The time required for the survey depends on the field length, but should not exceed 1-2 hour(s) per commercial field

In developed crop canopies, it is most often easier to walk across the field parallelly to the crop rows.

As the edges of the field are not surveyed, the method is not adapted to assess the ecological species richness.

References or examples of studies carried out by using this method/protocol:

This protocol is currently used in a farm network in France testing innovative cropping systems mostly designed to reduce the level of pesticide input (RMT SCI).