

## Spot spraying/patch spraying – perennial weeds

Some weed species are distributed in patches in the fields, and spot spraying of the colonies may be sufficient to control the weeds.

**DID YOU KNOW?**  
50-90 % of herbicides can be saved in fields with weeds in colonies

Readiness for use: 

Efficacy: 

### How it works

In this example weed colonies are located with a camera mounted on a drone, and the drone photos are used to make prescription maps for spot spraying. Other technical solutions as sensors or cameras mounted on the boom are also options. Many perennial weeds, e.g. thistles, couch grass, sow thistles and mugwort grow in colonies or patches in the field which make it relevant to spray the spots, and not the whole field. Also some annual weeds like wild oat often occur in patches in the field.

- An algorithm has been developed to detect thistle colonies in cereals crops, see below, and this algorithm is integrated in the field management tool Cropmanager.dk
- The algorithm has also shown to be suitable to detect couch-grass in a cereal stubble or resistant ryegrass in a growing cereal crop
- The spraying can be carried out either in full boom width, or on boom section or nozzle level, depending on the available technology and the nature of the task.
- Even the use of coarse prescription maps may save up to 50 % of herbicides compared to using a flat rate spraying.
- Altitude for drone photos can be 50-80 m. Flying typically takes approx. 1 minute per hectare (flying in 60 meters height with 70 % overlap). Mapping can be done with RTK (precision 2-3 cm) or without, which is less precise
- If drone cameras aren't available spot spraying can also be carried out directly by opening and closing the nozzles when spots are present



Figure 1. Drone photo with thistle colony in a winter wheat field. Rasmus Emil Jensen, SEGES Innovation.



Figure 2. Prescription map from [CropManager.dk](https://www.cropmanager.dk), 1x1 m pixels for spot spraying of thistle's, dark patches, are the areas that will be sprayed. The thistle patch in the ring is the colony in fig. 1.

#### Read more:

Rasmussen J, Nielsen J, Streibig JC, Jensen, JE, Pedersen, K.S. & Olsen, S.I. (2018) Pre-harvest weed mapping of *Cirsium arvense* in wheat and barley with off-the-shelf UAVs. [Precision Agriculture 20, 983-999](#).

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