

How to evaluate weed competitiveness in cereals

Problems

The selection and the description of cereal varieties for competitiveness against weeds under organic conditions requires the identification of relevant crop characteristics and the development of routine methodologies to measure them. Weed suppression cannot be attributed to one single characteristics but is the result of the interaction between several parameters.

Solutions

In Austria, knowledge has been accumulated in variety testing under organic conditions in wheat since 1995. Three main tools of weed control are: plant physiology, allelopathy and harrowing. The differences between varieties are mostly described in their plant physiology. The following parameters are important to specify: crop ground cover, growth habit, tillering capacity, rapid early growth to stem elongation, plant height, inclination of leaves and leaf area index.

Practical recommendations

In the Austrian official VCU-tests the following parameters are used to describe the weed competitiveness of the varieties as they are fast to be collected:

- Crop ground cover (in percentage at BBCH* 28, BBCH 31-32, BBCH 34-47)
- Canopy height (in cm at BBCH 31-32, BBCH 34-47)
- Frequency of plants with recurved flag leaves (scale 1-9 at BBCH 37-47)



Figure: Two different Austrian wheat varieties: the left one a good and the right one has a bad weed competitiveness (@ Flamm)

The tillering capacity is not regarded because it is included in the crop ground cover. The measuring of leaf area index (LAI) was abandoned in 2010 because measuring with special devices is very time consuming.

*BBCH-scale is a system for uniform coding of phenologically similar growth stages of all mono- and dicotyledonous plant species.

Further information

1. BAES (2019): 12_Cereals in organic farming (available only in german). In: Austrian Descriptive list of varieties 2019 – Agricultural species. <https://bsl.baes.gv.at/pdf-version/>
2. Kruepl C., S. Hoad, K. Davies, N-O. Bertholdsson & R. Paolini (2006): Weed competitiveness. In: *Susvar Handbook: Cereal variety testing for organic and low input agriculture*. Eds. Donner, D. & A. Osman, COST 860 – SUSVAR, pp.W1-W16.

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