Results on smut resistance of winter barley varieties published

Resistance of winter barley against loose and covered smut has been checked in field experiments for several years at Dottenfelderhof near Frankfurt/Germany and the results are now available on the internet (report in german only).

A main problem in repetitive seed production of winter barley according to the guidelines of organic farming is the risk of an escalation of infections with covered smut (Ustilago hordei) and in particular loose smut (U. nuda). The most effective way to avoid these diseases is the cultivation of resistant varieties. Therefore, in this research a screening of resistances in varieties has been carried out for several years. Concerning loose smut infection, four geographical origins of spores differed in their virulence checked by artificial infection of 15 varieties. 297 varieties were tested with spores originating from the testing site. Seven commercially available varieties and 12 recent lines showed genetically based resistances. Two varieties out of 15 favourites showed long-term resistance and furthermore resistance against all four geographic provenances of spores. Within the commercially available varieties, cleistogamy was observed in one variety after two test cycles and in five varieties after one cycle.

111 commercially available varieties were tested for resistance against covered smut by means of artificial infection. Two varieties remained without symptoms after two test cycles and five after one cycle. 25 varieties showed a moderate resistance. Resistance against loose smut did not correspond with resistance against covered smut.

Further field trials were conducted to compare common high yielding varieties with those chosen particularly with regard to good smut-resistance or tolerance. Cultivation followed the guidelines of organic farming. Quality criteria were grain yield and content of crude protein, and most important amino acids for animal nutrition (cystine, lysine, methionine, threonine, tryptophane).

In consideration of all factors, the results of varieties chosen for good resistance against loose smut were not inferior compared to those recommended for solely high yielding in conventional farming.

Besides resistance against smuts, the degree of weed suppression was also estimated by means of measuring leaf areas and lengths of stalks. The leaf area proved to be the main factor.

No variety achieved an all-embracing combination of good resistance against loose and covered smut, high yield including a satisfying content of essential amino acids and good potential for suppressing weeds. The availability of organically produced smut resistant or tolerant varieties is not satisfying as yet.

The full report can be found under:

http://www.dottenfelderhof-forschung.de/fileadmin/Publikationen/BLE_03_OE_657_LBS_und_IBDF.pdf.

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