NIAB tracks health of organic cereal seed

Encouraging results from NIAB show it is possible to produce healthy, reliable organic cereal seed. Selection of cereal varieties for organic production has to take into account a wide range of characteristics, and the availability of organic seed of a preferred variety is essential to maintain successful production, and allow access to the newest developments from plant breeders.

The processes of organic seed production mean that the seed will have to have undergone at least two generations of multiplication without use of conventional treatments. The absence of treatments means that diseases such as smuts and bunt could multiply freely, and that in some seasons seed might be affected by high levels of fungi such as *Microdochium nivale* and *Septoria nodorum*. If planted, the presence of high levels of these seedling blights could lead to significant loss of plant population.

There has been concern that it would be difficult to produce organic seed reliably without health problems, and that the supply of seed could be affected, perhaps restricting access to some varieties. The Defra funded project (OF033) on participatory research processes for selection of organic cereal varieties has been examining the issue of organic seed health, and as the last testing season comes to an end, some significant information is emerging.

During the project, the performance of wheat varieties has been examined at 20 different participatory sites for two years. The same seed lots, free from bunt and with low levels of seedling blights, were used at all sites, and then harvested seed was tested at NIAB for the presence of disease. The harvested seed would be the equivalent of farm-saved if it was used for further crop production.

Levels of Microdochium seedling blight were generally low, and few samples exceeded the threshold of 10% infection, above which treatments are used in non-organic production. However, in each year, there were some higher levels of infection. These were site specific, that is every variety at a single site was relatively badly affected compared to other sites, and clearly some aspect of local conditions influenced infection. Whether this was just weather or a more complex set of farm-related conditions, is not known.

Levels of bunt in both years were very low, and all of the harvested seed could safely have been used for further crop production. *Septoria nodorum* was found sporadically among the samples at low levels (around 1%).

Several of the samples had high ergot counts in each year, the highest being 35 ergots per kg. However, the occurrence of ergot has increased generally in conventional production over the last five years, and there is no indication that organic grain is either better or worse for ergot contamination than non-organic. Nevertheless, if the grain was kept for seed, cleaning would be advisable to avoid re-introducing the disease.

As well as participatory trials, samples have been tested from organic variety trials, certified seed production, demonstration trials and grower samples. Though organic sample numbers were much lower than those received for advisory testing from non-organic seed, it seemed clear that there was no trend for lower health levels in the organic seed.

Fig 1 shows some incidence comparisons (% of samples infected with any level of disease) for wheat, barley and oats in 2003, and Fig 2 shows the severity figures (% of samples above conventional treatment thresholds) for the same sample set.

Fig 1 % of samples with infection, 2003

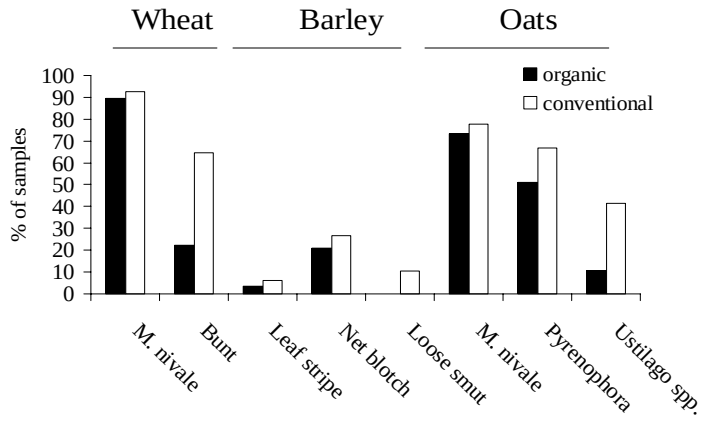
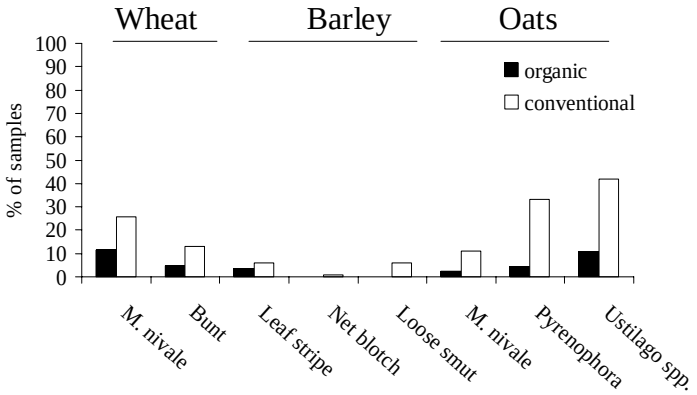


Fig 2 % of samples failing conventional treatment threshold, 2003



Though the health status of the great majority of seed samples examined in this project was high, there were still some causes for concern. Bunt in wheat was occasionally found at high levels, and if used, the infection would have caused extensive crop loss. Routine testing is needed to identify such high risk lots, and remove them from production.

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