

YIELD POTENTIAL IN ORGANIC AND CONVENTIONAL CEREAL SEED

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According to the EU seed regulation, cereal seed need to be able to germinate at least 85%, and in Denmark, national standards require a germination of 90-95% depending on the crop species. However, even when seed meets these standards, differences in germination vigour measured as germination speed exist. Pedersen et al. (1993) has shown that yield may differ up to 16% caused by differences in seed vigour in winter sown cereals, and also in spring barley it is shown that yield may differ up to 14% in seed lots that still meets the elevated Danish requirements for certified seed under conventional growing conditions (Emmeluth 1990, 1991). Under organic conditions, the effect is likely to be even higher, since especially weed competition is affected by the speed of emergence and early growth rate of the seedlings (Rasmussen and Rasmussen 2000). Müller (2013) showed that organic barley seed yielded 10-25% less compared with conventional seed of the same variety.

Some varieties of spring barley are produced by Nordic Seed in both organic and conventional quality. The seed is produced by different farmers but in general following the same drying schemes and post harvest handling in similar cleaning facilities. Therefore, seed samples are considered similar in most respects except for the growing conditions under organic and conventional conditions. Field trials was performed over three year in 2017-2019 with 3, 7 and 6 varieties included each year, and each year, each variety was sown from both 1-3 organic and 1-3 conventional propagated seed lots. Each year, 2-3 identical trials were conducted with the same seed lots in the same plot design of three replicates of 10m², and 350 plants/m². Field trials were grown under conventional sprayed conditions at Nordic Seed in 2017, 2018 and 2019 and under organic conditions at Nordic Seed in 2018 and 2019. At Agrologica, trials were sown under organic conditions in all years 2017-19. The trial at Agrologica 2018 was discarded due to draught and manganese deficiency. Growing conditions at Nordic Seed are good with clay loam soil with medium fertility, whereas conditions at Agrologica was poor sandy soils and especially in 2017 very low fertiliser level and high weed pressure. Lodging was not observed in neither condition.

Differences between varieties was significant in all trials, but the effect of organic versus conventional seed was not when all sites were included, and it cannot be concluded that conventional seed has better quality or results in lower yield. However, when analysing the data from each individual trial, significant differences were observed between seed grown organically or conventionally at the trials at Agrologica (ANOVA, $p=0.02$), but not at Nordic Seed. It is possible that differences was only expressed under stressed low input growing conditions at Agrologica, and not at better growing conditions at Nordic Seed. However, we need further investigations to document this speculation.

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