

Lower and higher input crop management in winter oilseed rape – influence on yield, quality and some another important properties

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ABSTRACT

Two different levels of crop management (seed rate, nitrogen fertilization, growth regulators spraying in autumn and spring, sulphur fertilization and fungicide use at time of flowering) were used to test specific response of 26 winter oilseed rape varieties (15 lines, 10 hybrids, 1 semidwarf hybrid). Trials were carried out at 7 locations in 2008/09 and 6 locations in 2009/10 as a small plot trial with 3 replications. Influence of additional inputs in higher management level delayed maturation by 3-5 days, reduced lodging (very different depending on variety), damage especially in case of *Sclerotinia sclerotiorum* and *Phoma lingam* and length of plants. Thousand grain weight was higher for most varieties in higher management level (+ 0.14 g = + 2.6 % on average), yield increased by 14 % on average (+8 to +20 % depending on variety, +2 to +55 % depending on location). Oil content of almost all varieties decreased in higher management level (on average by -0.2 %). Crude protein content of all varieties increased in higher management (on average by +0.4 %). Yield increase of varieties varied greatly due to trial location. As expected, higher yields were achieved at higher level of crop management, but response to higher inputs was not the same. Efficiency of input used by some varieties was better compared to others. This phenomenon can be exploited by farmers when choosing the most appropriate variety for the actual both environmental and fiscal position of their farm.

Key words: Winter oilseed rape – crop management levels – yield – efficiency of inputs

INTRODUCTION

Czech agriculture compared to the most of EU-countries has a lack of money for a real competition in crop and food production. Very important part of Czech farming represents an oilseed rape production. Better use of the rapeseed genetic potential could help in this situation.

MATERIALS AND METHODS

Two different levels of crop management (seed rate, nitrogen fertilization, growth regulators spraying in autumn and spring, sulphur fertilization and fungicide use at time of flowering, Tab. 1) were used to test specific response of 26 winter oilseed rape varieties (15 lines, 10 hybrids and 1 semidwarf hybrid). Trials were established at 9 locations in the Czech Republic in 2008/09 and 9 locations in 2009/10 as a small plot trial with 3 replications.

Table 1. Two levels of crop management

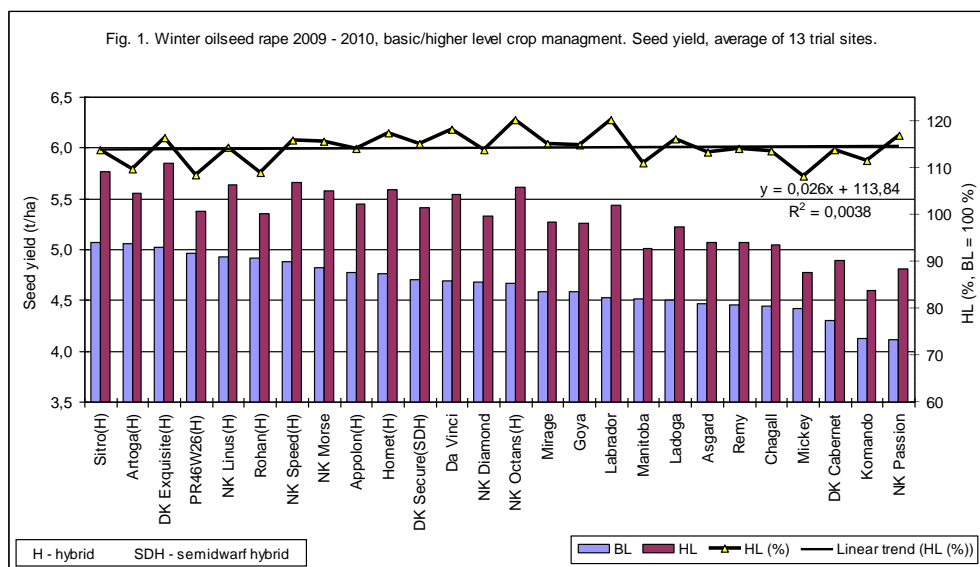
| | Levels of crop management | |
|--------------------|---|--|
| | Basic level (BL) | Higher level (HL) |
| Seed rate | lines 70 seeds/m ² hybrids 50 seeds/m ² | lines 70 seeds/m ² hybrids 50 seeds/m ² |
| N fertilization | 160 kg/ha after cereal forecrop 90 kg/ha after clover or cereal and legume mixture | 200 kg/ha after cereal forecrop 150 kg/ha after clover or cereal and legume mixture |
| S fertilization | 40 kg/ha after cereal forecrop 25 kg/ha after clover or cereal and legume mixture | 40 kg/ha after cereal forecrop 25 kg/ha after cereal and legume mixture |
| B fertilization | None | 0.2 kg/ha |
| Growth regulator | None | autumn – Horizon (5 th leaf) spring* - Caramba (height of growth 30 cm) |
| Fungicide spraying | None | Alto Combi 420 SC (BBCH 65) |

* without semidwarf hybrid

RESULTS

Trials were successfully harvested in 2008/09 at 7 sites and in 2009/10 at 6 sites, 2 locations were damaged and no exploitable from the final point of view in 2008/09 and 3 locations were damaged in 2009/10. Influence of additional inputs in higher management level delayed maturation by 3-5 days, reduced lodging (very different depending on variety), reduced length of plants and reduced damage especially in case of *Sclerotinia sclerotiorum* and *Phoma lingam*. Oil content of almost all varieties decreased in higher management level (+0.1 % to -0.8 %, on average by -0.2 %). Crude protein content of all varieties increased in higher management (on average by +0.4 %). Thousand grain weight was higher at almost all varieties in higher management level (-1 - +5 %), yield increased by 14 % on average (+8 to +20 % depending on variety, +2 to +55 % depending on location). Yield increase of varieties varied greatly due to trial location.

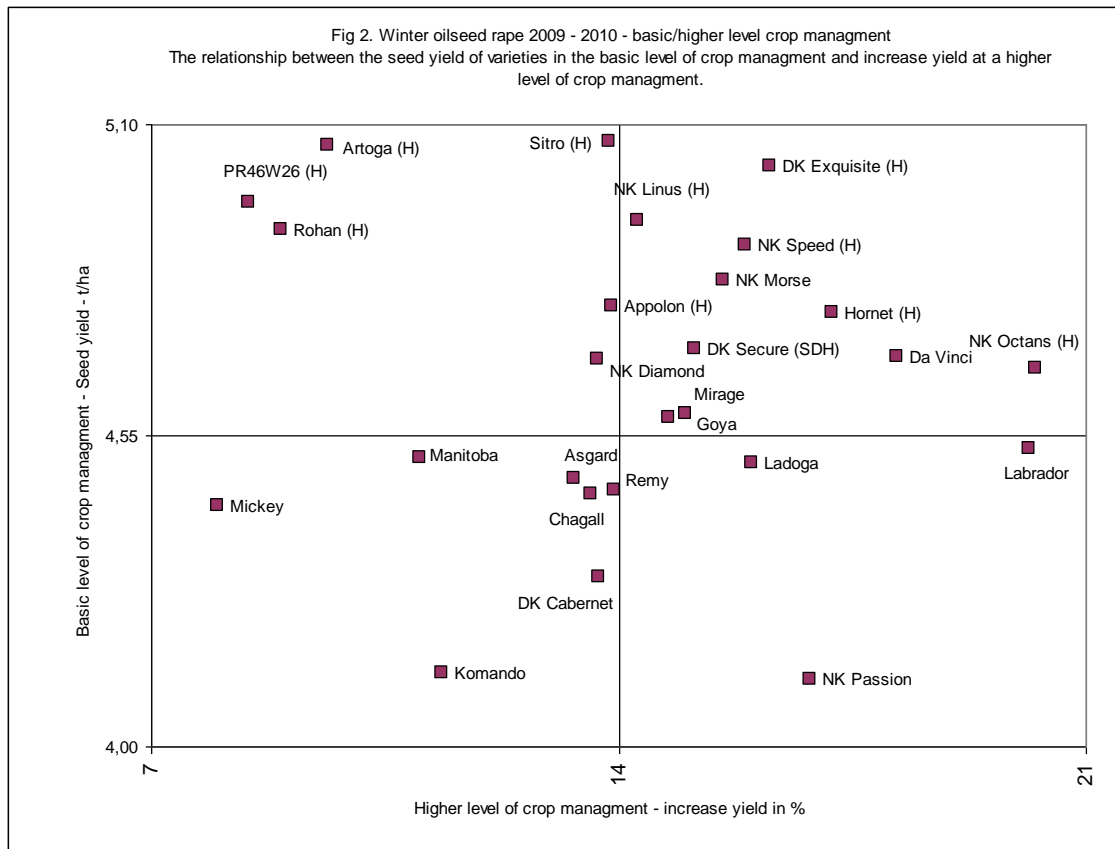
Fig. 1. Winter oilseed rape 2008/09 and 2009/10, basic/higher level crop management. Seed yield, average of 13 trial sites



DISCUSSION

As expected, higher yields were achieved at higher levels of crop management, but response to higher inputs was not the same (Fig. 1). The next graph (Fig. 2) shows differences in efficiency of inputs between varieties too. This phenomenon can be exploited by farmers when choosing the most appropriate variety for the actual both environmental and fiscal position of their farm.

Fig. 2. Winter oilseed rape 2009 - 2010 basic/higher level crop management. Seed yield, average of 13 trial sites.



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