Canola seed as affected by swathing time

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Abstract

Yield, weight, protein content (oil-free meal) and oil content of canola seed increased as seeds developed. Maximum values were obtained between 45-49 days after flowering, when seed moisture was 29-38%. Fatty acid composition of canola seed oil changed during seed development. The proportion of oleic (C18:1) and linolenic (C18:3) acids increased, while that of most other fatty acids decreased, as seeds developed, while Eicosenoic (C20:1) and erucic (C22:1) acids did not show a clear trend. Fatty-acids tended to stabilize by the 49th day after flowering. Early seeding resulted in higher seed yield, larger seeds, lower seed protein content and higher seed oil content, when compared to late seeding.

Introduction

Swathing is an important harvest operation for canola (*Brassica napus* L.) and many other crops in western Canada. Timing of this operation is important to ensure maximum seed yield and quality, as premature swathing of canola has been reported to reduce canola seed yield (Bowren and Kirkland 1975; Brown et al. 1999; Ogilvy 1989), seed weight (Ogilvy 1989), seed protein (Bowren and Kirkland 1975) and seed oil content (Bowren and Kirkland 1975; Ogilvy 1989). It has also been found to influence seed oil fatty acid composition and synthesis (Fowler and Downey 1970). On the other hand, delayed swathing may result in seed yield losses due to excessive shattering. This study has the objective of studying and assessing the agronomic and quality changes that occur as canola seeds develop, in relation to swathing time.

Material and Methods

The study was located at Melfort, Saskatchewan, on a Black Chernozem soil in 1998, 2000 and 2001. Treatments were: two seeding dates: early (early-mid May) and late (early-mid June), three cultivars: 44A89, AC Excel and Ebony, and 6 (1998) and 8 (2000 and 2001) swathing dates, spaced at 4-day intervals. First swathing was performed when seeds of the mid-maturing cultivars had near 70% moisture. Data recorded was seed moisture, seed yield, seed weight, seed protein content, seed oil content, and fatty acid composition of the seed oil.

Results

Seed yield, seed weight, seed protein content (oil-free meal) and seed oil content of canola increased progressively as seeds developed, reaching maximum values between 45-49 days after flowering (Fig.1). At this stage seed moisture was 29-38%.

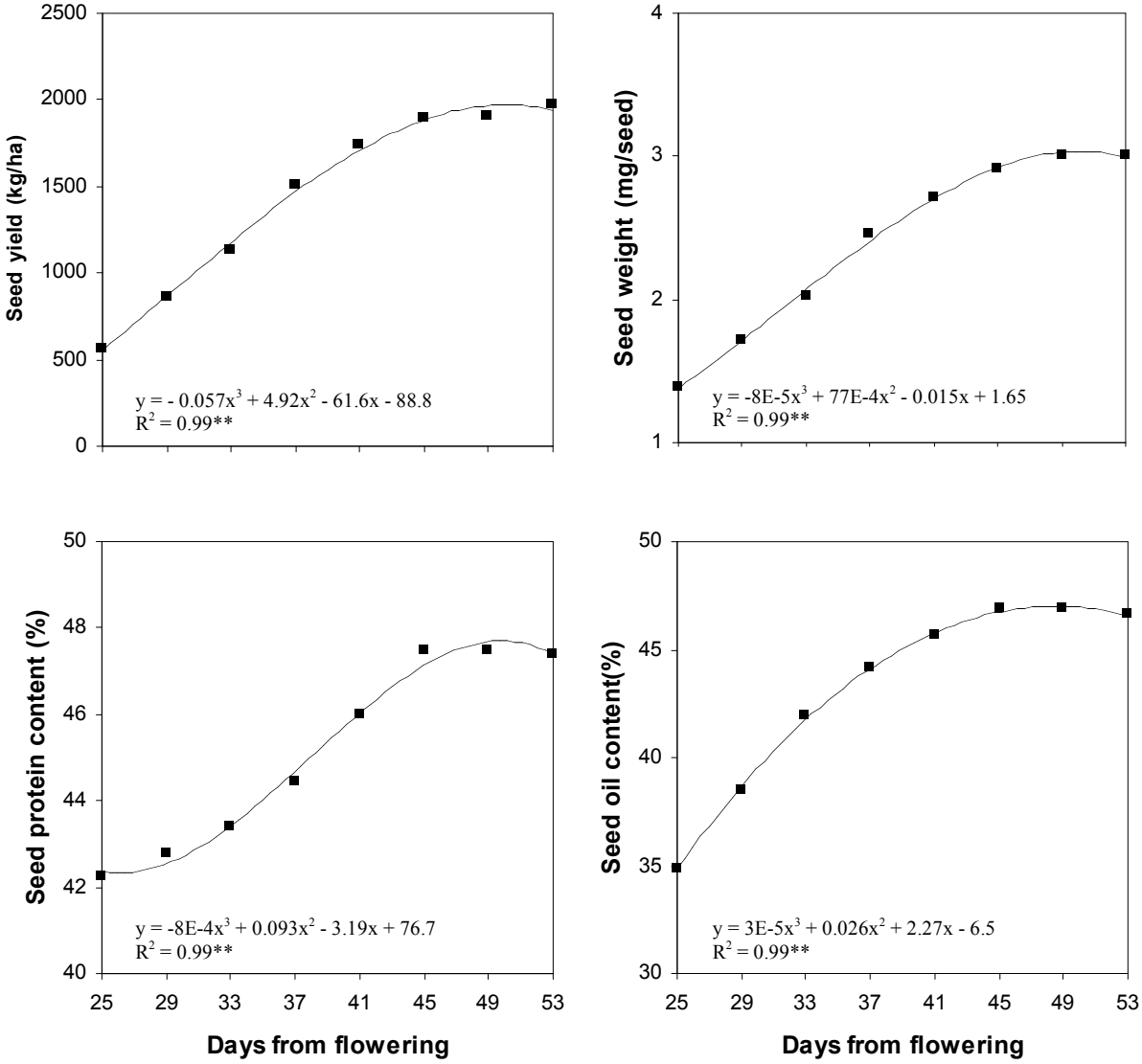

Figure 1. Effect of swathing date on seed yield, seed weight, seed protein content (oil-free meal) and seed oil content (averages of three years, two seeding dates and three cultivars).

Fatty acid composition of canola seed oil changed during seed development and tended to stabilize by the 49th day after flowering (Fig. 2). The proportion of oleic (C18:1) and linolenic (C18:3) acids increased, while that of most other fatty acids decreased, as seeds developed. Eicosenoic (C20:1) and erucic (C22:1) acids did not show a clear trend.

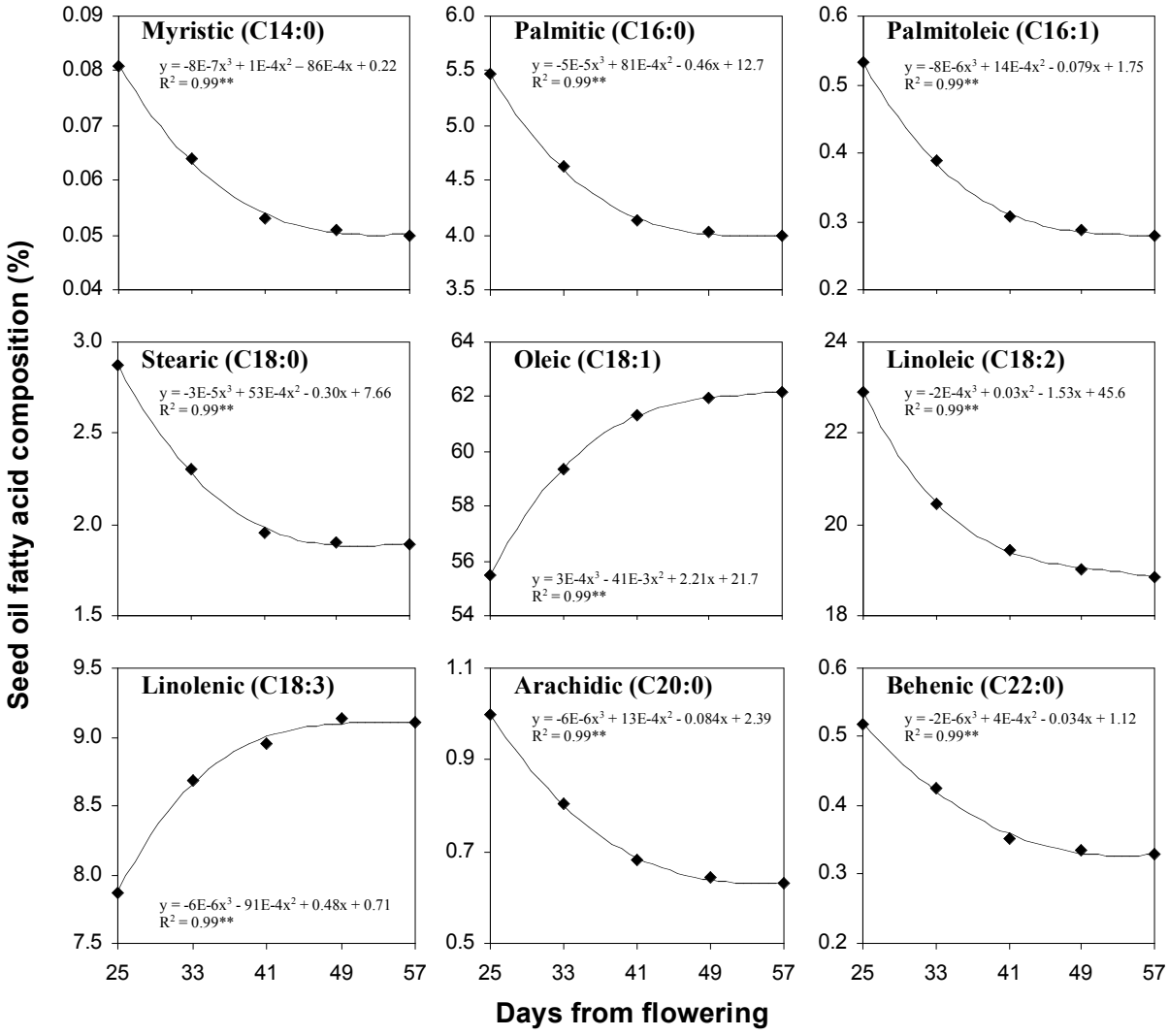

Figure 2. Effect of swathing date on the fatty acid composition of canola seed oil (averages of three years, two seeding dates and three cultivars).

Early seeding resulted in higher seed yield, larger seeds, lower seed protein content and higher seed oil content, when compared to late seeding (data not shown).

Conclusion

It is concluded that in order to obtain maximum seed yield and quality, and stabilized fatty acid composition of the oil, canola should be delayed at least until seed moisture nears 30%, which in an average year takes place around seven weeks after flower initiation.

References

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