Feeding value of organically grown green and field peas in the pannonical climatic region of Austria

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Introduction

The aim of this investigation was to compare pure stands and mixtures of green and field pea varieties regarding their competitive ability against weeds and pests, their nitrogen fixation capacity and N-dynamics in the soil, their feeding value and their economic efficiency. The field trial was performed in 2003 on the organically cultivated fields of the research farm of the University of Natural Resources and Applied Life Sciences, Vienna. Results concerning the feeding value of the different pea varieties as a criterion for their suitability as a feedstuff in organic farming are presented. It was concluded that the feeding value of field peas (*Pisum sativum* L. convar. *speciosum*) is equal or even higher to that of the green peas (*Pisum sativum* L. convar. s*ativum*).

Material and methods

The fields of the research farm are located in the pannonical climatic region of Eastern Austria in Raasdorf, north-east of Vienna (550 mm mean annual rainfall, 9.8 °C average temperature, Calcaric Phaeozems from fluvial loess). In this investigation, eight pea varieties were compared: three semi-leafless type green peas (Gotik, Herold and Sponsor), two green peas of the leaf type (Bohatyr and Erbi) and three field peas (Dora, Rhea and Sirius). The determination of starch content was done by polarimetric quantification according to Ewers (1), the tannin content was analysed as total bitter constituents (2). Other nutrients were determined by proximate analysis (1).

Results and discussion

The year 2003 was a very dry year. Total rainfall between March and July was 166 mm, 100 mm lower than the average rainfall during 1960–1990. This was the main cause for the relatively low grain yield, which varied between 1,118 kg ha^{-1} (Dora) and 2,416 kg ha^{-1} (Bohatyr).

Crude protein (CP) content (Figure 1), which is one of the most important criteria of feeding value varied between 223 for Gotik and 261 g kg^{-1} dry matter (DM) for Dora. By comparison, the DLG (3) feeding value tables show an average protein content of 251 g kg^{-1} DM for peas. Dora had the highest CP but the lowest grain yield.

The starch content for the eight pea-varieties (Figure 2) varied between 478 (Rhea) and 539 g kg^{-1} DM (Bohatyr). By comparison the average starch content for peas is 478 g kg^{-1} DM according to the DLG tables (3). From these data it could be estimated that the energy content of field peas was equivalent to that of extracted soyabean meal.

The tannin content was higher in the field peas (10.6 g kg^{-1} DM for Dora and Rhea) than in the green peas (minimum of 0.6 g kg^{-1} DM for Herold). The tannin content of field peas is likely to reduce feed intake and protein digestibility.

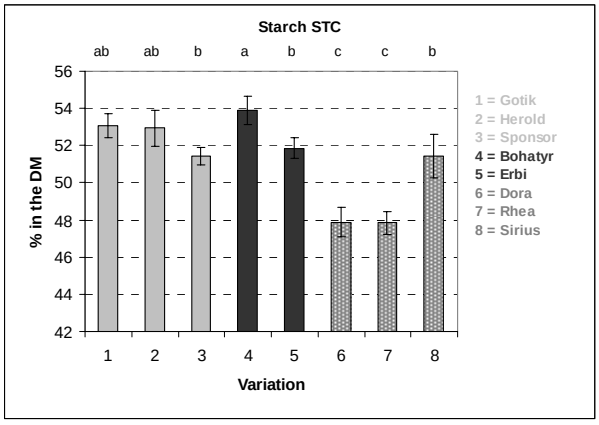

Figure 2. Starch content of pea varieties.

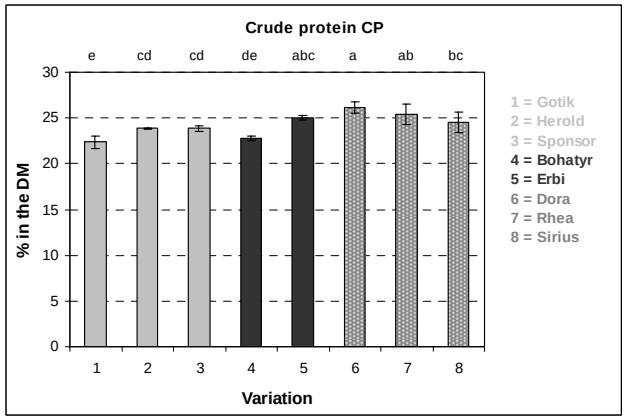

Figure 1. Crude protein content of pea varieties.

Conclusion

On the one hand, field peas are equivalent or even superior to green peas in many respects but, on the other hand, their tannin content may limit their use as a feedstuff.

(1) ALVA (Arbeitsgemeinschaft landwirtschaftlicher Versuchsanstalten) (1983). Österreichisches Methodenbuch für die Untersuchung von Futtermitteln, Futterzusatzstoffen und Schadstoffen, Wien, Selbstverlag ALVA.

(2) Naumann, C. and Bassler, R. (1976). Die chemische Untersuchung von Futtermitteln, Darmstadt, Vdlufa-Verlag.

(3) DLG (Deutsche Landwirtschafts-Gesellschaft) (1999). Wiederkäuer und Schweine – Kleiner Helfer für die Berechnung von Futterrationen, 10. Aufl., Frankfurt am Main, DLG-Verlags-GmbH.