

EXECUTIVE SUMMARY

Boron requirements of canola

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Soils of the canola producing areas in the Western Cape often show low boron contents ($< 5 \text{ mg kg}^{-1}$ hot water extraction) and because boron is one of the eight essential micronutrients required for normal growth and development of most plants and canola (*Brassica napus*) has a high demand for boron, boron may be a yield limiting factor in these areas. For this reason a field study was conducted during the period 2012-2014 at Altona and Langgewens in the Swartland and Roobebloem in the Southern Cape. Foliar applications of 0.5, 1.0 and 1.5 kg Solubor® (20.5% boron) per hectare were applied at either 40 or 60 or at 40 and 60 days after planting and compared to control plots where no boron was applied. Applications at 40 and 60 days after planting, coincides in most years with the period from the start of stem elongation till before the start of flowering.

In this study, done on sandy loam soil, plants did not show boron deficiencies during flowering stage in spite of low or even deficient boron levels in the soil. Although increases in plant boron contents with boron applications were found on all localities, responses were variable and did not show a clear trend with increasing application rates or correlation with the boron content of the soil. A possible explanation for this tendency may be because even the highest application rate of 1.5 kg Solubor® at both 40 and 60 days after planting add up to only $0.62 \text{ kg B ha}^{-1}$ which is low when compared to rates recommended in countries such as Canada and may also explain why no toxicity symptoms on vegetative plant were reported.

Boron (Solubor®) applications resulted in higher grain yields and grain oil content of canola and optimum application rates varied between 0.5 to 1.5 kg Solubor® ha^{-1} for different years at the same locality. Although rates of 2.0 and 3.0 kg Solubor® (applications of 1.0 and 1.5 kg at both 40 and 60 days after planting) did not show clear signs of toxicity on the canola plants, it also did not consistently resulted in higher yields and in some years even resulted in decreases in yield. For this reason an application rate of 1.0 kg ha^{-1} is generally recommended. At a cost of R28.00 per kg of (Solubor®), boron applications will without any doubt increase the profit margins of canola, because yield increases of more than 200 kg ha^{-1} which was generally obtained will add at least another R800 per hectare to

the income. Foliar applications should be done between 40 and 60 days after planting, but not later than the start of flowering.

Although these results clearly showed that foliar boron applications will help to increase the grain yield and oil content of canola produced in the Western Cape on soil with low boron contents, future research may include soil applications at time of planting and higher application rates, as recommended in some countries internationally.

Results of this study have already been presented at several Farmers' days and contributed to the increased production of canola in the Western Cape, because of higher yields obtained by the use of boron. Results will also be submitted to the South African Journal of Plant and Soil as a scientific article.