

The impact of inadequate boron levels on canola crop production



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The physiological role of boron (B) during canola crop production is well established. It plays a key role in cell wall biosynthesis, carbohydrate and protein metabolism, cell division, cell elongation, as well as the development of root and shoot growing points.

Boron is essential for the plant during times of rapid growth in autumn and stem extension in spring. It is also required for pollen germination and pollen tube growth, ensuring adequate seed set in the pods. Boron also plays a vital role in the plant's natural defence against invasion and attack from fungal pathogens.

Inadequate levels of B during canola crop production are known to be an inhibitory factor for seed vigour and quality, leading to low seed yield and inferior oil quality when B deficiency is not proactively managed.

Boron deficiency symptoms

Boron is the only nutrient that, when in inadequate supply, accelerates physiological processes instead of reducing them, and can therefore lead to abnormal cell growth. One of the earliest vegetative signs of B deficiency is the formation of brown necrotic areas within the pith of the stem. The plant leaves may also turn a paler green with interveinal yellow mottling and a reddish tinge around the margin. A reduction in the internodes of the stems gives the plants a stunted appearance.

Severe deficiencies can result in vertical cracking of the stems, which are often hollow at the stem base. Later in the

season, flowering appears restricted and distorted with infertile flowers, leading to a reduced number of pods and fewer seeds per pod, consequently producing significantly reduced yields.

The biggest risk, however, is that B deficiency can markedly reduce the seed and oil yield even when the plants show no obvious vegetative growth deficiency symptoms. For this reason, proactive/preventative management of B levels is advised.

Soil versus foliar application

Crops grown on soils with adequate B levels may still be at risk of B deficiency where its availability to the plant is restricted. This could be due to a high soil pH, dry conditions during the growth periods or inadequate zinc (Zn) supply.

Foliar application may be used to supply B to a crop when B demands are higher than what can be supplied via the soil. Additional benefits of foliar sprays over soil uptake include uniform application, immediate response to deficiency, and lower application rates.

When to apply boron

The symptoms of B deficiency are observed when B content in soil drops to 5 to 25mg/ha. Annual recommendations

of B for canola crops should be split up and applied three times a year to match the important physiological growth phases. These include autumn for root growth and frost tolerance, at the onset of stem extension due to rapid plant growth, and at the start of flowering to ensure pod set and the maximum number of seeds.

Nutrico recommends the use of the liquid fertiliser MolboroX® (Reg No B5122, Act 36/1947) to be applied up to 1ℓ/ha in autumn, and up to 1ℓ/ha at the start of flowering. MolboroX® is conveniently formulated so that each 1ℓ/ha supplies the optimal level of B (100g) in combination with Zn (6g), molybdenum (40g), and important biostimulants to boost crop growth, seed yield and quality. The user-friendly liquid format encompasses patented technology to deliver nutrients to crops in a highly mobile and absorbable format.

For more information on how to use MolboroX® to boost canola yields and increase the quality of the oil produced, contact your local Nutrico representative at 011 392 4072 or info@nutrico.co.za.