



Useful Facts

What is Sulphur?

Sulphur (S) is:

- A primary nutrient
- An essential component of several amino acids in the plant
- Plants take up sulphur from the soil as sulphate
- Sulphate moves readily in moist soils = potential for leaching

Adequate S is required for:

- Maximize oil concentration in canola seed
- Balance growth and development responses to high nitrogen (N) rates in order to optimize seed yield, especially in high-yielding canola cultivars

Sulphur Deficiency Characteristics and Symptoms

S deficiency occurs most commonly on well-drained, coarse textured and sandy soils with low organic matter, particularly in Dark Gray and Gray soils.

Inadequate available S (i.e., sulphate) in soil can seriously affect crop yield and quality (e.g., oil content), especially in canola.

Deficiency sources:

- High N fertilizer application on S-deficient soils
- High crop yield
- Growing high S-demand crops such as hybrid canola
- Continuous cropping
- Leaching of sulphate
- Decreasing levels of organic matter

Deficiency symptoms:

- Curled, cup-like top/young leaves
- Purple-reddish leaves
- Short spindly stems
- Poor pod development
- Poor seed set

Sulphur Fertility Management

Increase S fertilizer rate to optimize canola seed yield when applying high N fertilizer rates on S-deficient soils, especially if no response is observed to N fertilizer in high-yielding canola cultivars.

Timing and **form** of S fertilizer applied is more important than rate in terms of efficient uptake and plant use.

Timing:

Seeding – ideal time for S fertilization.

In-season – but only to correct S deficiencies as a RESCUE treatment.

- Best response if sulphate is applied before bolting stage
- Moderate response if sulphate is applied between bolting and early flowering stage

Form:

Sulphate forms of S fertilizer more effective at correcting S deficiency than elemental sulphur (ES) forms.

Fall applied ES better than spring applied ES, but still not as effective as sulphate even after several annual ES applications.

Factors affecting effectiveness of ES:

- Limited dispersion of S particles in the soil reduces potential microbial oxidation of granular ES to plant-available sulphate forms
- Broadcast, surface-applied powdered ES in suspension can produce similar results as sulphate fertilization, thus overcoming the dispersion problem

Ongoing research:

Three-year study to compare the effectiveness of using a new rapid release elemental sulphur (Vitasul) granular fertilizer with sulphate granular fertilizer to prevent/correct S deficiency in canola on S-deficient soils.

Results will be available in 2014.



Adequate sulphur
– healthy growth



Sulphur deficient
– purplish-red leaves



Sulphur deficient at flowering
– dull yellow/pale flowers



Sulphur deficient at pod formation
– very few small pods with only a few seeds



Sulphur deficient at bolting
– cupped yellow / reddened top leaves

Additional Information

For additional information about **sulphur** refer to the article 'Maximizing Yield and Quality of Canola Seed with Optimum Sulphur Fertilizer Management Practices in the Parkland Region of Western Canada' on the NARF website (www.neag.ca)

or contact:
S. S. Malhi at smalhi@neag.ca
Stewart Brandt at sbrandt@neag.ca

Acknowledgements

Thanks to D. Leach and K. Strukoff for technical help.



Northeast Agriculture Research Foundation