

Comparison of S-deficiency indicators in winter oilseed rape.

Ursula Balestra¹, Mechteld Blake-Kalff², H.-R. Pfeiffer³, A. Keiser⁴, D. Pellet¹

¹ *Swiss Federal Research Station for Plant Production, Changins, Nyon, Switzerland*

² *Agriculture and the Environment Division, IACR-Rothamsted, Harpenden, UK*

³ *Mineral Analysis Center, Institute of Earth Sciences, BFSH 2, Lausanne, Switzerland*

⁴ *Swiss High School of Agronomy, Zollikofen, Switzerland.*

Oilseed rape (*Brassica napus*) needs large quantity of sulphur (S) to obtain an optimal growth and yield. S-deficiency may cause severe yield reduction and can be detected by plant analysis (total S, N : S ratio, malate : sulphate ratio). Depending on the severity of S-deficiency, macroscopic symptoms are observed, as leaf chlorosis and deformations, pale yellow color of petals. Severe S-deficiency causes the absence of pod development or a reduced number of seeds per pod. However, macroscopic symptoms do not appear systematically or appear too late during crop development to apply corrective S fertilization.

The goal of our study was to test a bio-indicator able to show early deficiency symptoms during crop development and to test it with mostly used diagnostic indicators.

In field experiments, the bio-indicator consisted in oilseed rape plants grown on various spots of reduced area. The open pollinated variety Express was chosen as the indicator of S deficiency. The indicator plants were drilled 3 weeks later than the crop (Delayed Drilling, DD). For experimental purpose, contrasting S and N regimes were applied to both the brassica crop (Normal Drilling, ND) and the indicator plants.

Critical values for total S in young expanded leaves were established in our conditions and were similar to published data. Field observations were validated by plant analyses (total S, N: S ratio and malate : sulphate ratio). We observed a positive correlation between visual symptoms in indicator plants and the most used diagnostic indicators of S-deficiency in oilseed rape.

We concluded that visual symptoms of S-deficiency in bio-indicator plants give an accurate information about S status of oilseed rape crop.