INTRACROP®

Technical Bulletin

Technical Help Line: 01926 643801

Sulphur Plus with Crusulf ®

Foliar applied Sulphur for Optimum uptake and crop availability

Yield and quality are key targets for the farmer. Many agronomists are now employing bio-stimulants such as Uplift ATG to help the plant offset the effects of abiotic stress on yield and quality. Uplift ATG works to increase the efficacy of the nitrogen cycle within the plant. However, it must be remembered that no matter how much Nitrogen is available within the plant the conversion into proteins is negated if the plant is deficient in Sulphur.

Sulphur issues are an increasing problem across the UK with a recent review of 2015 soil analyses showing that 89.2% of soils growing wheat and 94.5% of soils growing oilseed rape are sulphur deficient.

This is now having a serious impact on areas such as yield and grain protein in cereals, with sulphur deficiency alone costing up to 2T in lost yield.
The critical value for grain sulphur is 0.12% and grain surveys have shown that 15% of wheat samples are below this critical value and 34% of samples are only just above minimum at 0.12% to 0.14%

It is important that crops maintain the correct N:S ratio to be able to manufacture proteins. The N:S ratio should be 17:1 and this ratio is synergistic …… if the ratio is changed because the available Sulphur is low it does not matter how much Nitrogen is put on, the N will not have any benefit to the crop as it cannot be utilised. Indeed, adding more N to a crop suffering chlorosis from S deficiency just makes symptoms worse due to effect on N:S ratio and the symptoms of S deficiency simply show more readily as more N is applied.

Remember that assessing sulphur issues is not easy:

- Sulphur can only be taken up by the roots in sulphate form and sulphates in the soil are easily leached
- All other forms of sulphur, apart from sulphate, require mineralisation before they are available and this is a slow process – elemental sulphur can take 6-12 months to be converted into a form that the plant can utilise.
- Sulphur is immobile in the plant, remaining in the older leaves (which is why S deficiency shows as a yellowing in young growth)
- Resolving in-crop sulphur deficiency therefore means that sequential treatments need applying in order to allow correct protein production and growth during the spring, and to ensure that grain / seed sites are maintained (as well as the size of the seed) and ultimately the crop's yield.
- Getting a soil analysis completed this autumn will indicate current S availability, but remember that overwinter leaching will make things worse! Tissue analysis will give a more accurate indication of immediate deficiency. Treatments in identified fields should start at the end of February, with sequential applications at monthly intervals during March April and May. These applications need to coincide with Nitrogen applications.

When applying Sulphur for foliar uptake, use a formulation that is properly absorbed and utilised by the plant

Many sulphur products utilise elemental Sulphur BUT this form is **not** taken up directly by the plant. It must first be oxidized to sulphate (SO4 ions) before the plant can absorb it. Conversion of elemental S to sulphate S is carried out by soil bacteria known as thiobacilli and this can take 6-12 months. As a result, applications of elemental sulphur made to counteract deficiency need planning into the rotation up to 1 year in advance!

- Suspension Concentrates (eg Sulphur Flowable) utilise elemental S that has been ground very finely for foliar application BUT unless the sulphur is ground finer than 2 microns (and most are > 2 microns) it will stay on the outside of the leaf and not be taken inside the foliage as a nutrient.

Products that are formulated to be taken up by the plant to rectify a Sulphur deficiency are best based on ATS (Ammonium Thiosulphate). Another highly active Sulphur source is Di-Sulphone Sulphur (sold by Intracrop as Crusulf®).

- ATS based products contain 26% S which is fully available to be absorbed and utilised by the plant.
- Di-sulphone sulphur (**DSS**) - **Intracrop Crusulf ®–** is the quickest and most active sulphur source available. **100mls of DSS will provide double the amount of S supplied by a standard 5L rate of ATS.**

SULPHUR PLUS – a foliar applied and fully utilised sulphur product incorporating ATS + DSS (Intracrop Crusulf ®)

Intracrop have co-formulated ATS with DSS (Crusulf ®) in a unique formulation to create **SULPHUR PLUS**, a class-leading foliar applied sulphur that provides optimum availability and uptake.

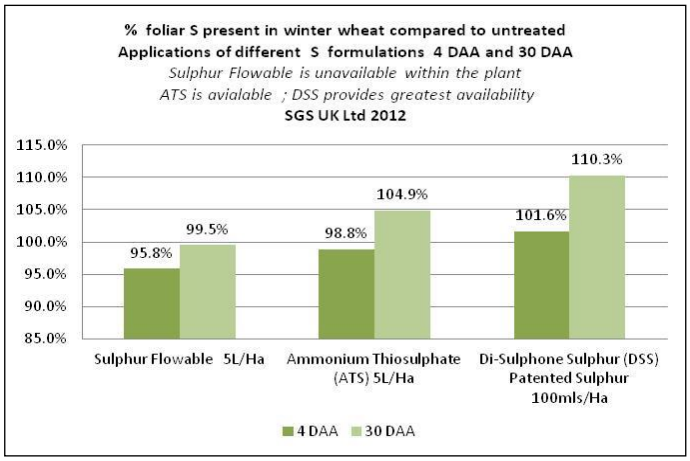
- SULPHUR PLUS delivers 330 g fully available sulphur & 140g nitrogen per litre
- SULPHUR PLUS mixes rapidly and completely, has excellent compatibility, is stable in the tank (pH6) and will not increase crop phytotoxicity from other pesticides being applied at the same time.
-

Winter Wheat

This trial clearly demonstrates that an SC sulphur formulation (eg Sulphur Flowable) is not taken up by the plant and does nothing to increase the S levels within the plant either 3 days or 30 days after application.

ATS based products are taken up and utilised, increasing foliar S levels from a single 5L application by 5%.

DSS is the most available S source with just 100mls/Ha of DSS increasing the leaf's internal S levels by 10%.

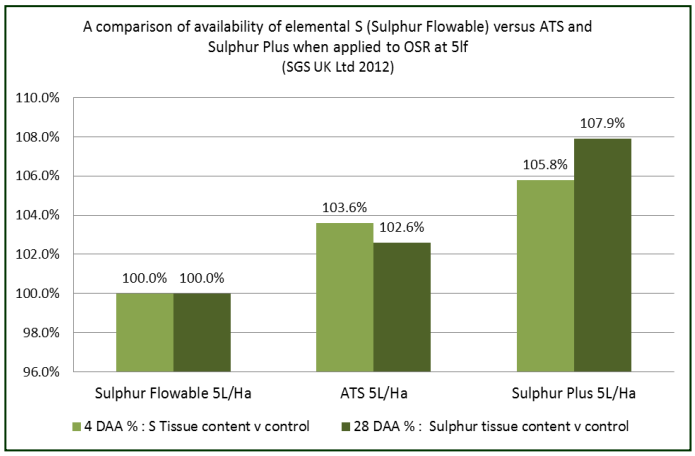


Oilseed Rape

This SGS trial again shows that SC sulphur formulations (eg Sulphur Flowable) are not taken up by the plant.

ATS based products, by comparison, are taken up and utilised, increasing foliar S levels from a single 5L application by around 3%.

5L of SULPHUR PLUS (combining ATS and with highly active DSS) provides the greatest increase in available S, far exceeding that provided by the same application rate of a straight ATS based product.



SULPHUR DEFICIENCY : REMEMBER

- When S deficiency is identified, the first **SULPHUR PLUS** application should be in time to be available to the crop at stem extension, and this must be followed by 2 to 3 further applications at monthly intervals to ensure adequate availability pre-flowering
- Soil applied elemental S can take around 1 year to break down into a form that can be used by the plant, so always plan soil applied S requirements 12 -18 months ahead.