

# Modern combinable crops hungry for magnesium

The role of magnesium in building yield in cereal and oilseed crops is rapidly coming in to focus. *Farm Business Agronomist* reviews a recent trial that returned some interesting results

A prolonged spell of recent dry weather coupled with a cold North wind for many weeks earlier in the year has left many crops showing the characteristic signs of magnesium deficiency.

Under such conditions the role played by magnesium as a nutrient raises itself every year. Many agronomists believe that modern higher performing cereals and oilseed rape cultivars have an increasing requirement for this major nutrient and that soil, particularly in combinable rotations, is being mined of the valuable nutrient.

Recent analyses of oilseed rape and cereal plant matter has revealed magnesium levels below the critical values of 0.2% and 0.15% of dry matter respectively, suggesting that growers are under appreciating the demand modern varieties exhibit for this important nutrient.

In an attempt to quantify



Symptoms of magnesium deficiency in oilseed rape

crop requirement of Mg, which plays a significant role in building yield, independent researchers, Armstrong-Fisher has conducted a series of field trials investigating the response of soil applied mag-

nesium in cereals and oilseed rape. The research, funded by K+S UK & Eire Ltd aimed to test the response to magnesium on a range of different soil magnesium levels to investigate whether current fertiliser

practice can be improved.

Current official advice from RB209 for combinable crop rotations recommends that magnesium is only justified when the soil magnesium index falls to zero (0-25mg/l).

**“Now that a potash + Kieserite fertiliser is available it is more practical to maintain magnesium status”**

However, the trials work supports opinion from the field which is strongly suggesting that waiting until the index falls to zero is unwise and leads to a ‘fire fighting’ approach. Many of the best responses were seen on soils with magnesium indices above zero and it is thought that rooting and



Symptoms of magnesium deficiency in wheat

environmental conditions are more important in determining the potential magnesium supply to a crop. The following tables show responses in the Armstrong-Fisher trials together with some agricultural merchants own trials.

#### NEW ADVICE

This advice is in part believed to be an historic oversimplification due to the impracticality of applying relatively small quantities of magnesium to replace the crop offtake as is

the policy with P and K. Magnesium (MgO) offtakes for a 10 tonne wheat crop and a 4 tonne rape crop are both around 25-35 kg and until recently it was impractical to apply such a quantity of Kieserite. “Now that a potash + Kieserite fertiliser product (Korn-Kali) is available it is more practical to maintain magnesium status,” says Jerry McHoul technical manager of K+S UK & Eire.

Evidence that crops are struggling to receive sufficient

Table 1: Cereal trials

	Cultivar	Soil magnesium mg/l (Index)	Yield in tonnes/ha		Yield increase (%)
			Control (no Mg)	With maintenance (6-24kg MgO/ha)	
Germany (2006)	Lomerit	(2)	6.63	7.04	6
Yorks (2007)	Alchemy	266 (5)	10.13	10.41	3
Lincs (2007)	Consort	25 (0)	7.61	7.7	1
Lincs (2007)	Gladiator	15 (0)	8.22	8.36	2
Lincs (2008)	Welford	20 (0)	10.05	9.95	Nil
Norfolk (2008)	Sahara	26 (1)	8.89	9.6	8

Table 2: Oilseed rape trials

	Cultivar	Soil magnesium mg/l (Index)	Yield in tonnes/ha		Yield increase (%)
			Control (no Mg)	With maintenance (6-24kg MgO/ha)	
Lincs (2007)	Pollen	27 (1)	4.74	5.02	6
Lincs (2007)	Expert	25 (0)	4.5	4.6	2
Yorks (2008)	NK Bravour	121 (3)	3.93	4.16	6
Yorks (2008)	NK Bravour	121 (3)	4.06	4.1	1
Yorks (2008)	NK Bravour	121 (3)	4.06	4.2	3
Lincs (2008)	Castille	22 (0)	3.2	3.11	3
Lincs (2008)	Castille	31 (1)	4.51	4.49	Nil

magnesium for full yield is also apparent from foliar magnesium trials which showed an average response in cereals of 0.24t/ha and in OSR of 0.22t/ha with two applications of bittersalz (magnesium sulphate) applied at 10 and 12.5 kg/ha respectively.

While foliar magnesium is an effective way of treating and preventing a shortage of magnesium, it should not be relied upon to supply the crop's entire magnesium requirement. The bulk of the supply

needs to come from the soil.

Evidence supporting this comes from field trials combining both soil applied magnesium together with bittersalz applications where even greater responses were observed.

What is crucial is that any magnesium fertiliser applied is water soluble. Insoluble Calcined magnesite is often added to compound fertilisers as a source of magnesium, but has been proven to be far less suitable than Kieserite which is fully water soluble and there-

fore immediately available to the crop.

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