

# Potash trial highlights pitfalls of omitting K fertiliser

For some, the temptation to take a potash holiday has been stronger than ever in the last six months as prices for fertilisers increased steadily in 2008.

What is important, however, according to Jerry McHoul, K+S UK & Eire technical manager, is that any decision to do so is done in a calculated way where the risks are known.

He points out that the current recommendations from RB209 are based on robust experiments carried out over several decades. "The reason that the target index for arable crops is 2- is because that is the economic optimum (for most soil types at least) at which to maintain soils for maximum N response and for profitability," he says. With Nitrogen, all of the cost can be directly assigned to the yield and therefore profitability of that year's crop. The calculation of how much to apply therefore is relatively simple provided you have a good idea of the value of the crop at harvest. With P, K and Mg, the costs are recouped over several years, while the amount to be applied is calculated in the basis of what was removed by the previous crop, not what will be required by the current crop. "Reducing or omitting base fertiliser inputs is a gamble because the stakes are often unknown," he says.

## EFFECT ON CROP YIELD AND QUALITY

When do you start to see a serious yield penalty? In many classic potash experiments, the effect of reducing K is often not immediately visible, but becomes apparent through reduced crop performance in the subsequent years. "K performs a vital role in maintaining the water balance within crops which in turn is necessary for the efficient uptake of other nutrients, particularly Nitrogen. and increases standing power, crucial to the plant's ability to intercept



maximum sunlight," he says. These two factors are responsible for a large proportion of yield potential and if deficient, N efficiency plummets leading to dramatic reductions in yield. Studies conducted recently at Rothamsted Research show that the difference in N efficiency between a plot with sufficient K and a soil index 0 was equivalent to more than 100kg N/ha.

## POSITIVE YIELD RESPONSE

To further improve the understanding of the effect of reducing K and Mg inputs, K+S UK & Eire, in 2007 embarked on a long-term fertiliser experiment investigating the consequences of neglecting K and Mg for a sustained period of time in a whole crop rotation. The soil K and Mg status will be monitored to give an indication of just how quickly soil fertility is eroded, or if current advisory rates are adequate to maintain fertility in modern, high yielding programmes.

The trial is on a sandy loam in Norfolk and features barley, peas and sugar beet. The initial K level was a low index 1 (62 ppm) and the magnesium an index 0 (22 ppm). The first crop to be harvested in 2008 was a crop of winter malting barley which yielded 7.19 t/ha from the control plots with no K or Mg fertiliser. When K fertiliser was added as MOP, the yield increased to 7.75 t/ha and when a mixture of K and Mg was applied (Korn-Kali), the yield increased further to 7.8 t/ha.

"In this case there was a clear response from freshly applied K which could be easily measured even in year 1. The response to Mg was less than in

many other trials on Mg index 0 and 1 soils we have running," says Mr McHoul.

What he finds concerning is that according to NRM figures, 37% of all arable land is at index 0 or 1 for K and is therefore at risk of similar penalties on yield and quality in this year alone.

## IMPACT ON QUALITY

In the trials both Hectolitre weight and Thousand Grain Weight (TGW) increased where K was applied and when K+Mg was applied, a further increase in TGW was observed from 46.3 to 47.1

The trial has been carefully repeated in another crop of winter barley this year and Mr McHoul will be closely monitoring the crop throughout the growing season. Interestingly, in the classic PDA experiments at Stoneleigh, yield of winter wheat was halved when K fertiliser had been omitted for three consecutive years and in year four, the wheat yielded around a third of that with adequate K.

## SUMMARY ADVICE

Recommendations for K do not, and have not, changed with the higher cost of K fertilisers

- Utilise manure sources of K and Mg whenever possible and taken into account in fertiliser plans

- Identify areas where nutrients are in excess and improve efficiency by spreading only where nutrient is needed

- At K index 0 and 1, think very carefully about the potential yield penalty from reducing inputs in the current crop and for future crops

- At K index 2-, if you decide to cut suggested rates, remember that the balance will have to be restored in the future

- Consider a maintenance application of magnesium at index 1 or 2-; results from Korn-Kali trials strongly indicate a cost-effective response in cereals and OSR crops.

## Guidance for use of Grazers effectively against pigeon and rabbit damage



**Grazers is a safe and easy systemic spray, applied to any crop effectively, against damage from rabbits, pigeon, deer & geese**

Grazers is most effective when sprayed onto the young growing leaf eg early leaf emergence in winter wheat and OSR or late winter/early spring as new growth is starting to emerge. It can be used effectively throughout the winter, where crops are at risk, so long as there is some movement in the plant and some foliage for it to stick too, although it may not last as long.

A cost effective way of using Grazers for rabbit damage is to treat the headland (30m boom width) before or just as the rabbits start coming into the field.

For pigeon damage it can be sprayed effectively to spot treat weaker areas which are being targeted by pigeons in late winter. This will allow the crop to grow away from the damage to a point where its less at risk.

### Main Points

Grazers is systemic, harmless and beneficial to the plant

- Treat headlands first effectively against rabbit damage

- Spot treat weaker areas in late winter effectively against pigeon damage

- For modules/ transplants treat twice prior to planting then again immediately when in the field

- Do not tank mix  
Leave 3 days before or after any other application

*Grazers was developed from a foliar trace element application in 1999 in the North of England where Grazers is still manufactured today.*

# GRAZERS

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