



# AN or Urea?

**No contest, says Defra research,  
AN is the best choice**



**Everyone knows that ammonia can be lost by volatilisation following urea application. This reduces the amount of crop available Nitrogen on average by 24%. Traditionally, it was thought that if you got urea on early, you'll be alright! But will you?**

Results from three years of Defra-funded research have blown away that theory. The Defra NT26 programme looked at alternative Nitrogen sources for UK farming and included extensive field evaluation by a group of eminent researchers.

	Urea		AN	
	% loss	% range	% loss	% range
Grass	27	10-58	2	0-13
Arable	22	2-43	3	0-10
Overall	24	2-58	3	0-13

**The key findings were: AN remains the best option for UK agriculture and early application of urea did not guarantee reduced ammonia losses.**

## **Unpredictable**

In cereals the losses ranged from 2-43% of the total urea N applied. In grassland losses were even more dramatic. There was a 58% loss of ammonia from urea applied to a clay grassland soil in Devon on 2 March and, at a nearby sandy soil site, 43% was lost from an even earlier application on 28 February.

Therefore, to compensate for this loss, the solution could be simple: apply more.

Indeed the researchers worked out that to maintain yields and quality, the optimum N rate when using urea would have to be, on average, 20% higher than for AN. However, applying more may cause loss of yield or lodging, has negative environmental impact and would breach NVZ regulations.

In fact, because of the variability of urea, the crop may be under fertilised, reducing yield and quality or over fertilised, increasing the risk of lodging. How can you manage the unknown?

The biggest challenge of using urea under UK climatic conditions is that it is simply not as reliable as AN. Predicting N losses from urea is very difficult and depends on factors which are largely outside farmers' control. This loss might be as little as 2%, so on a par with AN, but it could be as high as 58%. **In short using urea is a much riskier option.**

### **Environmental Problems**

Ammonia losses are a key concern, not only because of the reduction in crop available Nitrogen, but also because ammonia contributes to acid rain and over enrichment of sensitive habitats (eg heathlands).

In addition, there is a National Ceilings Directive target to reduce ammonia emissions to less than 297k tonnes a year by 2010.

Current ammonia emissions from UK agriculture are estimated at 265k tonnes per year. Of this, fertiliser ammonia emissions account for around 27k tonnes.

Any significant increase in the use of urea fertiliser is likely to prevent the UK government meeting its commitment to reduce ammonia emissions.

**Using urea will inevitably increase farming's environmental footprint.**



### **Other Conclusions**

The experiments also concluded:

- Urea gave lower yields in winter cereals (0.3-0.4 t/ha)
- Urea lowered grain protein (0.3% less)
- No significant difference in leaching and surface run-off losses between AN and urea
- Urea did not achieve a good spread pattern with no prilled urea being of sufficient quality to fully spread test
- AN products spread well at 24m when machines were set-up correctly
- Only AN products achieved a good spread to 12m when oscillating spout equipment was used

### **Is Urea Cost-Effective?**

To achieve the same yield as AN you would have to put on an extra 20%!

**Applying 20% more fertiliser not only costs more financially, it also increase agriculture's impact on the environment.**

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