

DEMONSTRATION



Winter Wheat: Germany, Oct 2008 - Aug 2009

KEY RESULTS

An independent comparison in wheat showed:

- ♦ Use of a single TwinN application plus 90 kgN/ha gave the same yield as 180 kgN/ha with no TwinN.
- ♦ Measurements of soil nitrogen showed that both the TwinN plus 50% N treatment and the 100% N treatment had very similar soil nitrogen levels both before and after the crop. This indicates that the ability of TwinN to maintain yields at lower applied N fertiliser rates in this comparison was not achieved by stripping soil nitrogen.

TREATMENTS AND RESULTS

TREATMENT	Yield (T/ha)	Protein (%)	Kg CO ₂ eq/T Yield [#]	Total Residual Soil Nitrogen After Crop (kg/ha)
T1 TwinN + 90 kgN/ha	7.1	11.1	118	40.0
T2 No TwinN, 180 kgN/ha	7.1	11.3	230	41.9

The average total soil nitrogen across the field before planting was 35 kgN/ha.

[#]The relative carbon emissions for each treatment have been determined utilising the Renewable Fuels Agency's Carbon Calculator. The measurement is as CO₂ equivalents per tonne of yield. Assumptions are that all urea was applied in one pass, and that TwinN required an additional pass over the field. Calculations have included TwinN's 1.2 kg CO₂ equivalent/ha as rated by Carbon Associates, Australia.



No TwinN, 180 kgN/ha TwinN + 90 kgN/ha

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DETAILS OF DEMONSTRATION

The demonstration was performed and analysed by the Institute for Agricultural and Environmental Analysis, Germany (Institut fuer Agrar und Umweltanalytik).

The comparison was in a single uniform field divided into two 4.8 ha blocks.

Crop Nutrition

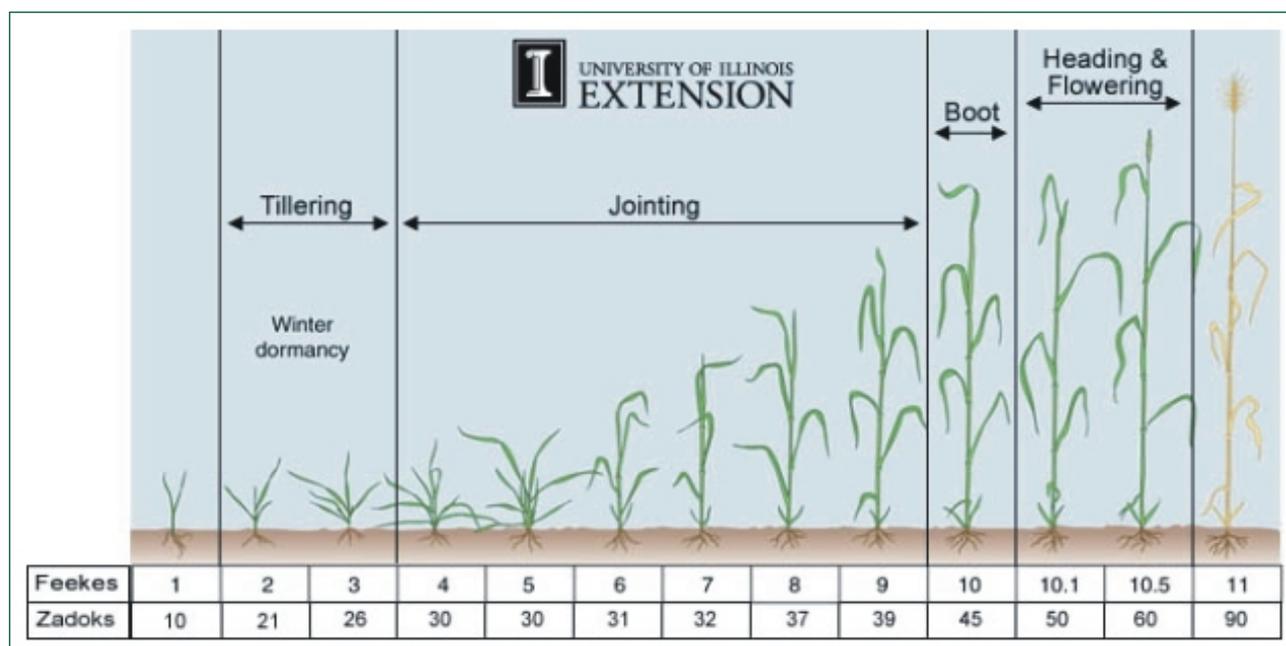
Treatments were 90 kgN/ha plus 1 TwinN application versus 180 kgN/ha with no TwinN. Nitrogen was applied as urea on 27/4/09. The entire field received 20,000 L/ha liquid manure and a standard application of P and K pre-planting.

Crop Data

Crop	Winter Wheat
Variety	Ludwig
Previous Crop	Barley
Sowing Date	5/10/08
TwinN Applied	5/4/09 at GS32
Harvest Date	10/8/09
Soil Type	Loam
Crop Season Conditions	Very cold, wet conditions were experienced in February and March 2009, no rain in April, then a normal season followed.
Soil Analysis	Samples were taken at 30 and 60 cm depths at 10 samples per ha and pooled for analysis.

TwinN Application

A single application of TwinN was made at GS32 using a boom spray and 200 L/ha water under cool, moist conditions.



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CONCLUSIONS

Use of TwinN enabled a significant reduction in nitrogen fertiliser application rates without loss of yield. This enables:

- ◆ Improved profitability due to decreased production costs.
- ◆ The ability to maintain yields if N fertiliser applications are limited by legislation.
- ◆ Decreased carbon footprint (49%) due to reduction of urea use (which has a high carbon footprint).
- ◆ Improved soil health.

Soil nitrogen tests before the comparison showed similar levels of nitrogen across the site before the trial and also after the trial. This indicates that TwinN allowed maintenance of yield at lower urea application rates by providing fixed atmospheric N₂ to the crop via the N fixation process and by improved capture of applied N fertiliser. This resulted in the same levels of Total Residual Soil Nitrogen across the site, after the crop, with no extra depletion in either treatment.