BALANCED NUTRITION TRIAL

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Sites Streatham, Penshurst, Gnarwarre

These results relate to the trial printed on page 91 of the *1998 Field Day Book.*

BACKGROUND

In 1998, Pivot again had trials of red wheat at Gnarwarre, Streatham and Penshurst. All three experiments investigated the effect of various combinations of nitrogen, phosphorus fertiliser on grain yield.

RESULTS

Streatham: Phosphorus fertiliser alone increased grain yield from 4.0 to 4.3 t/ha. Fertilisers containing both nitrogen and phosphorus increased grain yield from 4.0 to 4.6 t/ha. In economic terms, both of these were "break-even" results, i.e. fertiliser cost was just balanced by increased grain yield.

Penshurst: This site was not sown until June 12th. As the usual sowing implement was not available, a replacement machine was used. Seed was sown too deep, after which the crop was patchy, even the surviving plants having a struggle. Average grain yields from the various fertiliser treatments were:

No fertiliser	2.07 t/ha
Phosphorus fertiliser only	2.97 t/ha
Nitrogen fertiliser only	2.25 t/ha
Phosphorus and nitrogen fertiliser	2.76 t/ha

As these figures illustrate, the response was to phosphorus fertiliser rather than nitrogen. Despite low grain prices and these low yields, the response to phosphorus was still profitable at approximately $2 worth of extra grain yield for every $ invested in phosphorus.

Gnarwarre: In 1996 and 1997, grain yields of red wheat on Pivot's plots at Gnarwarre ranged from 4 t/ha without fertiliser to 6 t/ha with adequate phosphorus and nitrogen fertiliser. In 1998, despite having produced the best looking crop yet, grain yields were ultimately only 1.7 - 2.7 t/ha. The plots were not able to be harvested until the last week in February, by which time the crop had received a fall of 50mm of rain. Grain still in the head at harvest time had shot and a considerable quantity had shed onto the ground. If there were any responses to fertiliser evident before the late summer rain, there was no chance of them being quantified at a profitable level after the rain.

Soil Tests: Soil phosphorus levels at the three sites were as follows:

	Olsen P (mg/kg)	**Colwell P (mg/kg)**
Streatham	11	44
Penshurst	15	58
Gnarwarre	15	46

These moderately low levels of soil phosphorus were consistent with the responses to phosphorus fertiliser obtained.

Overall: In 1999, provided we can avoid the problems experience in 1998 with the late sowing and harvesting, Pivot will be looking to contribute to development of the Decision Support System for nitrogen in high rainfall cropping, as proposed by the recent Southern Farming System research forum.