Plant Science into Practice

N-RATE x FOLIAR BIO-STIMULANT INTERACTION ON WHEAT YIELD

Niab investigated whether a timely applied sequence of bio-stimulants could reduce the reliance on soil applied N fertiliser and increase yield.

N-rate had a significant effect on grain yield at both trials sites in Kent and Dorset. In Dorset, the higher N-rate (220 kg/ha) produced 0.86 t/ha higher yield than the 150 kg/ha of N treated plots (averaged across all foliar bio-stimulant treatments) (Figure 1). The bio-stimulants such as NP PGA and TWO-OXO had positive effects on grain yield under low fertiliser inputs but no effect when used with higher N-rates.

In Kent, averaged across bio-stimulant treatments, the higher N-rate (220 kg/ha) produced 0.58 t/ha higher yield than the 150 kg/ha N treated plots (Figure 2). The bio-stimulants, such as NP PGA and Blue N, had positive effects on grain yield when applied under low N-input systems.

A few bio-stimulants, such as NP PGA and TWO-OXO, resulted in higher grain yields than the control plots under low N input systems. However, when higher N rate was used, none of the bio-stimulants had any positive effects.

In other trials Niab investigated the effect of a range of bio-stimulants on grain yield of winter beans, winter oats, maize, potatoes and fodder beet. Vixeran and Blue N had significant positive effects on grain yield in maize and winter beans. T6P had a postive effect on the yield of winter oats. NP PGA, amino acid-based bio-stimulants such as Zonda, Bridgeway and Amino A Flo had positive effects on the yield of potatoes and sugar beet.

Figure 1. Effect of interaction of N-rate x bio-stimulant on grain yield (winter wheat, Dorset, 2024)

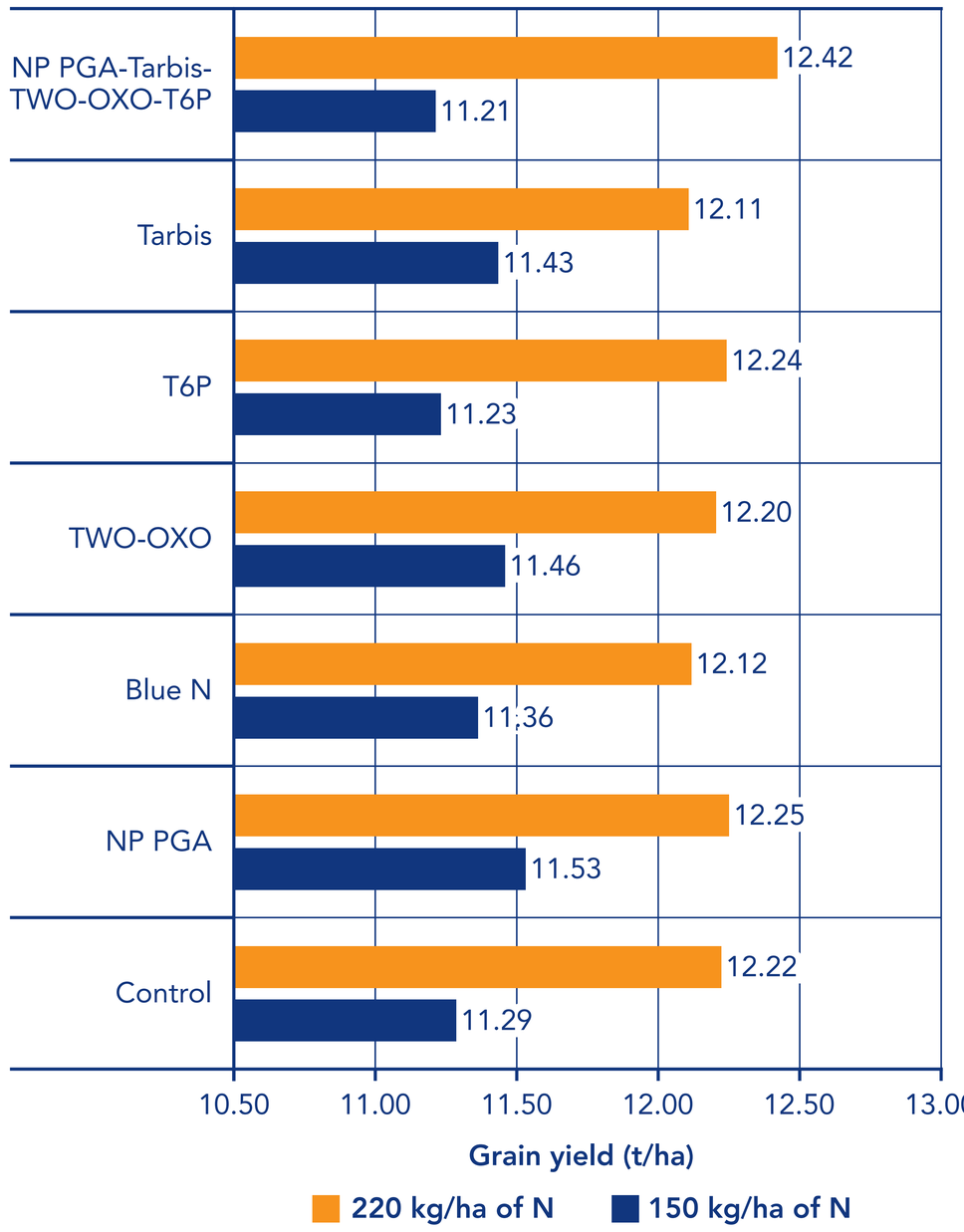
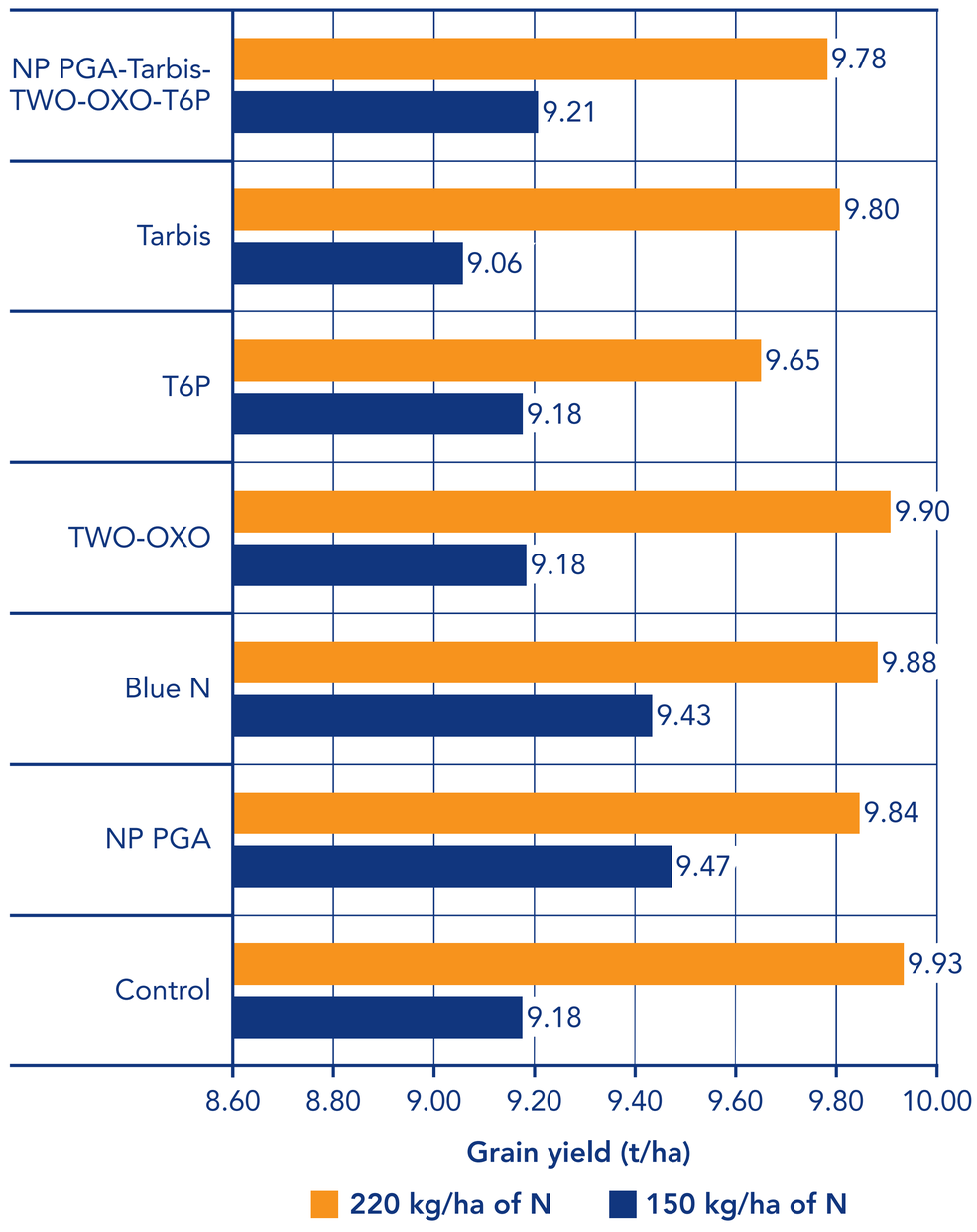


Figure 2. Effect of interaction of N-rate x bio-stimulant on grain yield (winter wheat, Kent, 2024)



Products used in trials

Product	Active ingredient and concentration	Manufacturers' assertion
Blue N	Bacteria: *Methylobacterium symbioiticum*	Improves nitrogen use efficiency
NP PGA	N 30 g/l, P_2O_5 260 g/l, K_2O 70 g/l, Mn 5 g/l, Zn 5 g/l	Improves rooting
T6P	Trehalose-6-Phosphate as a signalling molecule	Improves root and shoot development
Tarbis	Endophyte based bacterial product	Improves rooting and nitrogen use efficiency
Two-Oxo	2 Oxoglutaramate (TWO-OXO)	Improves nitrogen use efficiency