Determining the value of starter fertilisers to building early season biomass in winter wheat

Background

This project continues on the work carried out at Strategic Farm East in 2017/18 that began to evaluate the role that starter fertilisers can have on aiding early crop development, and how this then further relates to crop yield.

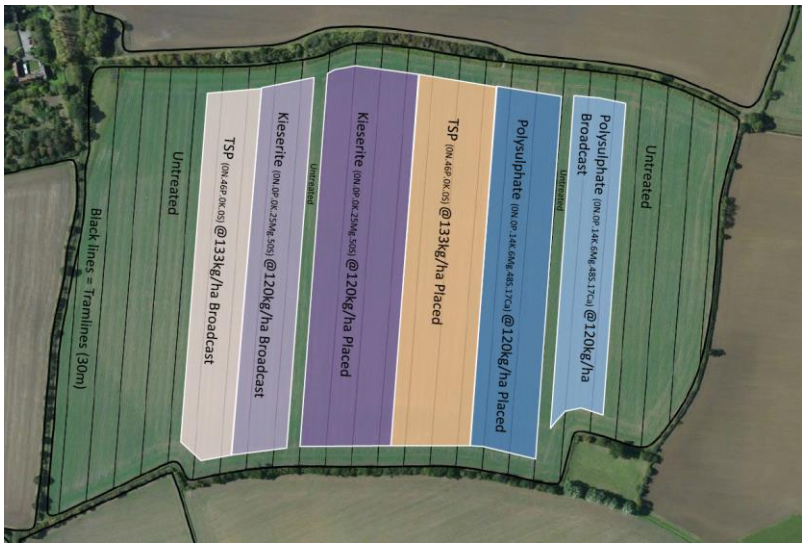
Aim

To create a better understanding of how the use of starter fertilisers, and the technique used to apply them, may contribute to increasing early season biomass in winter wheat. This is in response to the agronomic challenge of achieving high yielding fields, whilst using integrated management techniques such as delayed drilling to reduce black-grass.

Methodology

Site details

Field: Barn Field
Soil type: Sandy loam
Variety: Santiago
Drilled: 12 October 2019



Assessments

Comprehensive assessments to quantitatively assess early season biomass, which includes emergence and NDVI assessments 1, 2, 3 and 4 weeks after drilling, analysis of plant tissue 2 and 4 weeks after emergence, tiller number, destructive biomass and LAI at growth stage 21-25, and analysis of yield data from combine yield monitor in August.

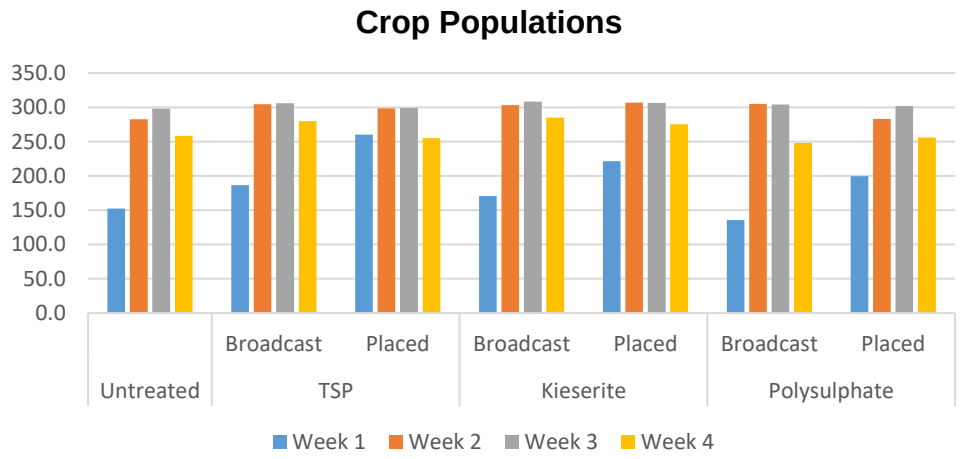
Costings

Treatment	Nutrient Content	Application Rate	Product Price	Operation Cost	Total
Polysuphate Broadcast	0N:0P:14K:6Mg:48S:17Ca	120kg/ha	£19	£8	**£27**
Polysuphate Placed	0N:0P:14K:6Mg:48S:17Ca	120kg/ha	£19	With drill at planting	**£19**
TSP Broadcast	0N:46P:0K:0S	133kg/ha	£46	£8	**£54**
TSP Placed	0N:46P:0K:0S	133kg/ha	£46	With drill at planting	**£46**
Kieserite Broadcast	0N:0P:0K:25Mg:50S	120kg/ha	£32	£8	**£40**
Kieserite Placed	0N:0P:0K:25Mg:50S	120kg/ha	£32	With drill at planting	**£32**

Preliminary results

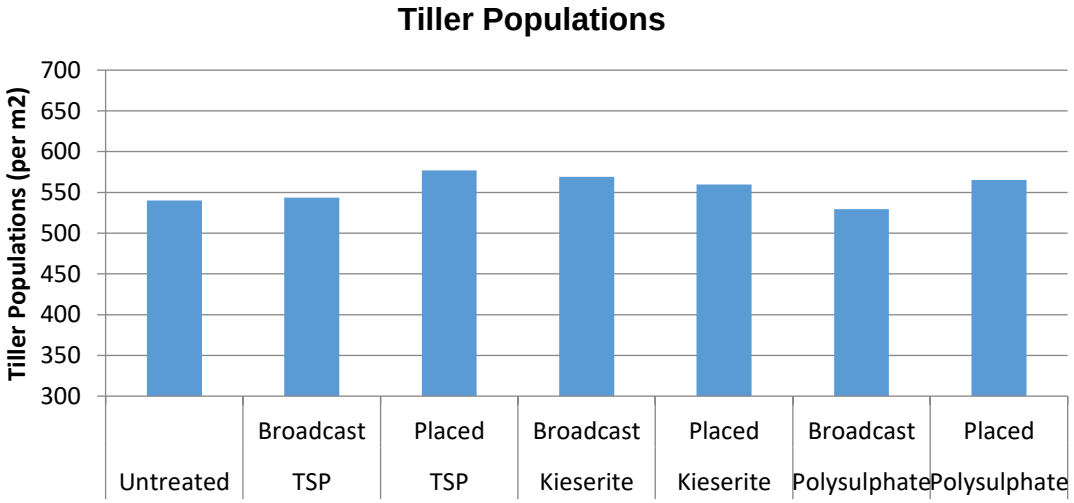
Crop populations

The use of starter fertilisers, in particular when placed, has shown to increase the speed of emergence. The addition of polysulphate created a visible difference in the field. Despite the early differences, each plot, including the untreated, caught up, leaving differences of statistical note. The benefit of increasing the speed emergence may be of greater benefit in years/fields, where slug pressure is particularly high. No slug damage was observed at all during the assessments. The year was very good for establishment, so in poorer years we may expect for the initial observations to be more permanent.



Tiller populations

These counts were done in the late autumn, and show some small differences, particularly from placed TSP and placed Polysulphate. There was a general benefit of using Kieserite, with no difference from application type.



Shoot:root ratio

These results come from the biomass sampling in the spring. This suggests that there has been some possible effect in improving above ground biomass from using Kieserite, TSP when broadcast, and an increase of root mass relative to shoot mass from the polysulphate. However, the polysulphate plots had overall lower mass of both above and below ground biomass.