

Effect of seed treatment on wheat canopy and production (II)

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Amedeo Reyneri, Massimo Blandino, Federico Marinaccio
Dept. of Agronomy - University of Turin (Italy)

Objective

After the relevant results of the 2013 field trial, the effects of 3 different soil tillage systems on winter common wheat were analysed to stress the advantage of innovative seed treatment in more severe conditions.

Experimental design (2014)

A field experiment was set up in North Italy (44° 53' N, 7° 52' E; altitude 260 m), in a loamy soil (Typic Hapluster).

3 tillage systems x 3 seed dressings were compared following a factorial design (split plot) with 4 replicates:

- **T0**: No seed treatment (reference)
- **T1**: Seed treatment with CELEST® (a.i. fludioxonil)
- **T2**: Seed treatment with VIBRANCE® (a.i. sedaxane)
- **PL**: Ploughing (30 cm depth)
- **MT**: Minimum Tillage (harrowing 12 cm depth)
- **SS**: Sod Seeding

Measurements

Canopy: plant density, canopy greenness¹

Crop diseases: Seeding blight, Septoria Tritici Blotch (STB)

Production and quality: yield, test weight (TW), grain protein content (GPC), gluten

¹Normalized Difference Vegetation Index (NDVI) from tillering (BBCH 20) to Physiological maturity (BBCH 90) through a hand-held optical sensing device, GreenSeekerTM® (Trimble©, Sunnyvale),

Results

- The greenness was influenced by seed treatments in all the tillage systems: from stem elongation to anthesis T0 has significant lower NDVI values. No differences among seed dressing were observed (**Figure 1**);
- Seed dressing treatments (T1, T2) promoted a higher head density at harvest than T0; VIBRANCE® has furthermore increased crop density compared to CELEST® (**Table 1**).
- No effects on STB and FHB were noticed;
- The seed dressing significantly increased grain yield for all tillage systems. No differences among seed dressings were pointed out (**Table 1**).

Conclusions

This trial was conducted under severe conditions for wheat growth and health. In all the tillage systems seed protection has enhanced the crop density and greenness, leading to higher yield. Compared to CELEST®, VIBRANCE® has slightly increased the canopy growth during stem elongation when the crop had experienced more severe conditions of the sod seeding.

Figure 1. Effect of seed treatment on canopy greenness from stem elongation to the end of ripening among three types of tillage (NDVI)

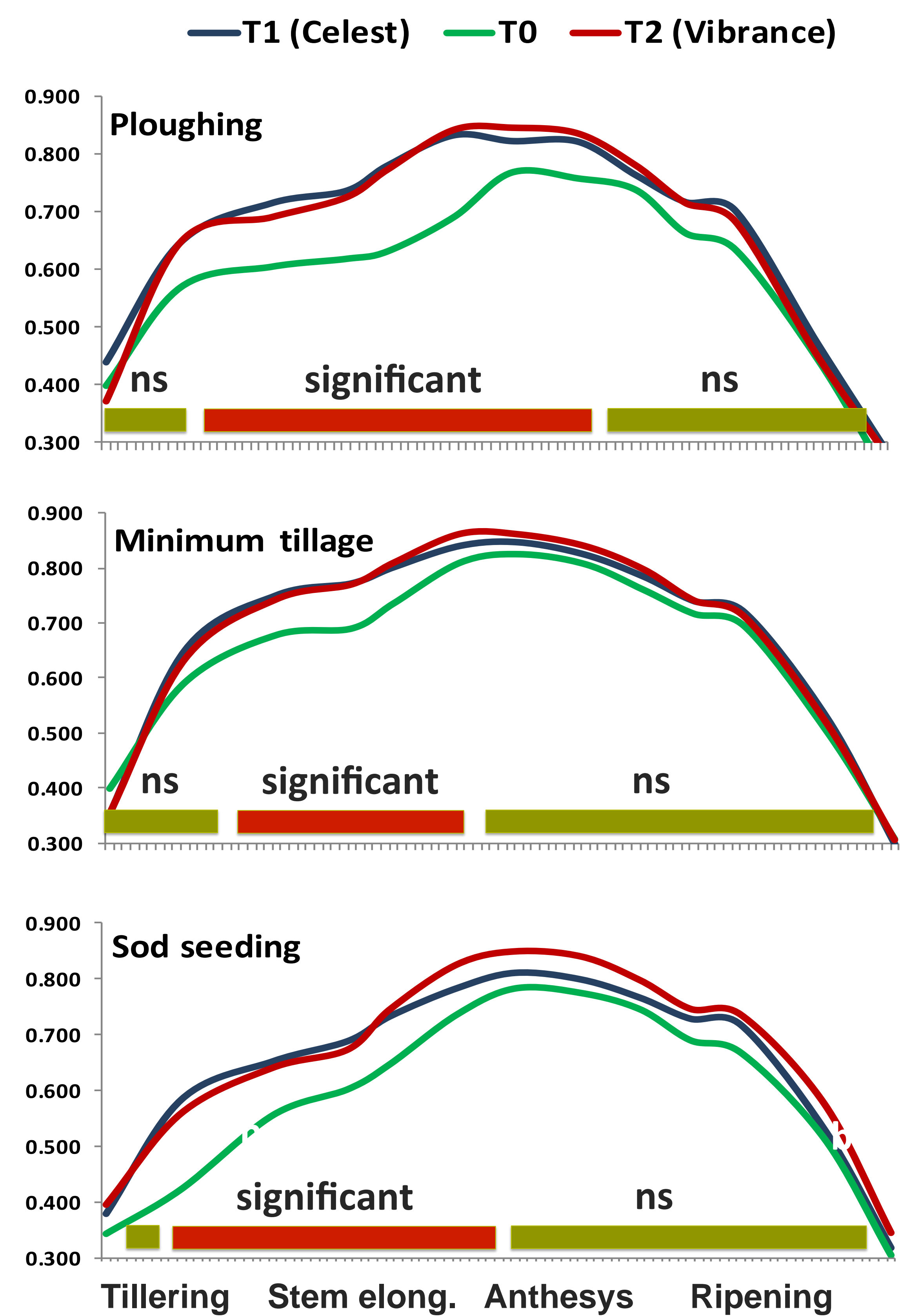


Table 1. Effect of seed treatment on yield (t/ha)

| | Head density (n/m ²) | Yield (t/ha) |
|--------------------|-------------------------------------|-----------------|
| T0 | 509 c | 6.0 b |
| T1 Celest | 531 b | 6.6 a |
| T2 Vibrance | 579 a | 6.7 a |
| <i>P</i> (F) | 0.027 | < 0.001 |

