Toolbrunup Group seeding demonstration: In a dry season start does type of seeding machinery impact wheat yield?

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Key message

- In 2017, no consistent differences in wheat yield were observed among plots established with different sowing implements.

Background

The dry start in 2017 prompted the Toolbrunup grower group to establish a seeding demonstration to compare different seeding machinery in the tough conditions. The demonstration site was located 20km south east of Tambellup in a long paddock that had three major soil types — a loamy sand, a heavier (reddish brown) loam and a pale sand, allowing the comparison of machines on a range of soil types.

Methods and results

On 9 June the demo was sown to Mace wheat with the following six machines; John Deere Conserva Pak®, Ausplow DBS®, Horsch®, John Deere 1820 Air Drill®, Flexi Coil 5000® and John Deere 1890 Disc Machine ®.

The trial was replicated twice, and for simplicity, machines followed the same order in the second replicate. Due to limited paddock size, there was only one replicate of both the Flexi Coil® and John Deere 1890 Disc Machine® in the loamy sand.

Seeding rates of machinery were calculated by weighing the seed before and after the strips were sown. Due to the variation in seeding rates (Table 1) plant counts were adjusted by a factor to give an equivalent 80kg/ha seeding rate.

Table 1. Seeding machinery row spacing and seeding rate. Seeding rate calculated by weighing the seed pre and post seeding the demonstration strips.

Machines	Row spacing (cm)	Seeding rate (kg/ha)
John Deere Conserva pak	30	80
Ausplow DBS	25	67.5
Horsch	30	71.5
John Deere 1820 air drill	25.4	73.5
Flexi-Coil 5000	22.5	74
John Deere 1890 Disc Machine	19	77

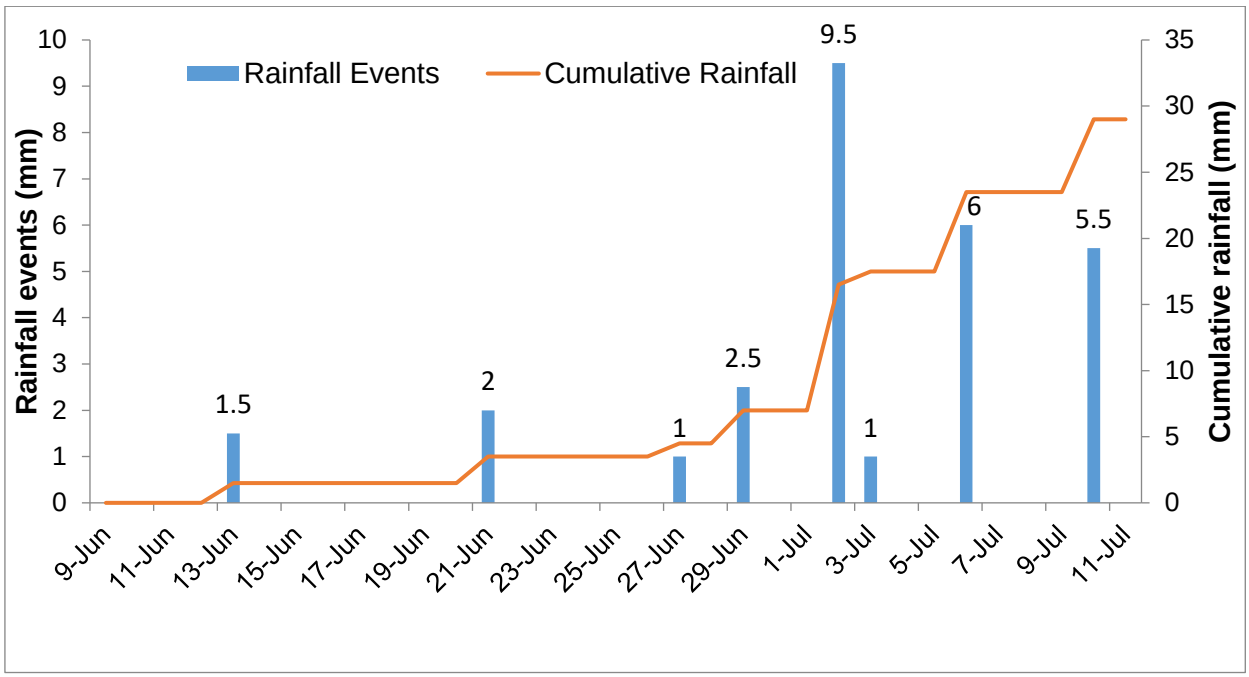

Figure 1. Rainfall from when the site was seeded on 9 June until 12 July, when the second lot of plant counts were taken.

The site had roughly 20mm for May; however, this only included one rain event greater than 5mm on the 14 May. From 1–9 June there was less than 1mm. Seeding conditions were dry and dusty. The site received less than 5mm between sowing and the first plant counts on 28 June. Plants were counted again on 12 July after 29mm of post-sowing rainfall. Plant counts for the two dates and the three soil types are shown in Figure 2.

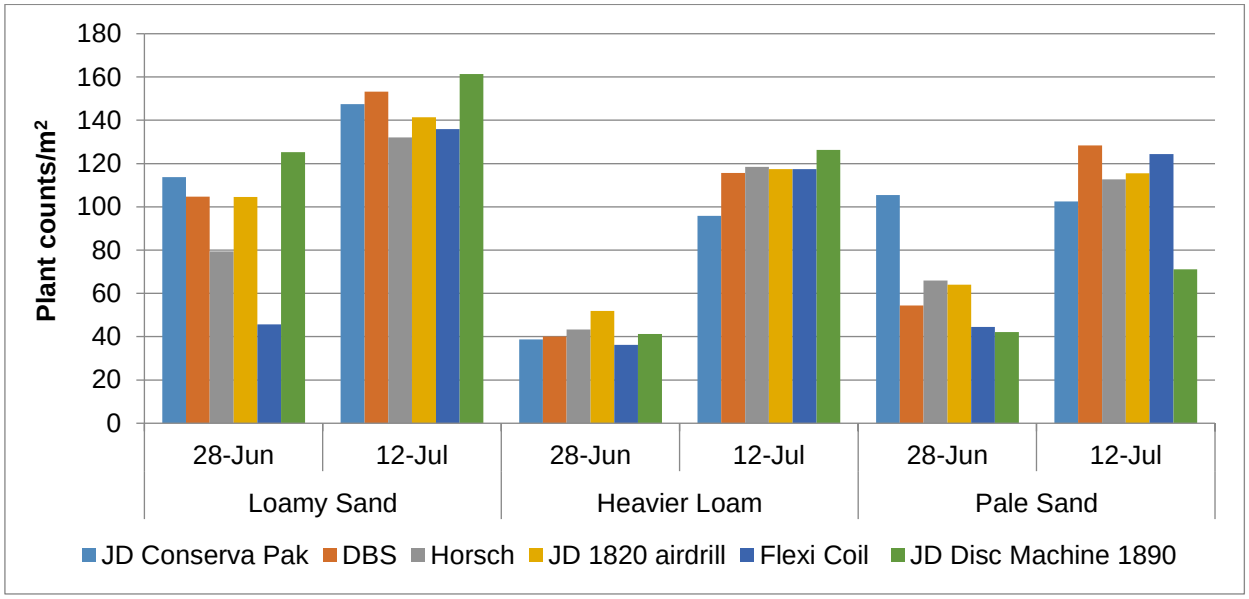

Figure 2. Plant establishment counts for Mace wheat taken on 28 June and 12 July. **Average of two replicates, except for the Flexi Coil and John Deere Disc Machines in the loamy sand which had one replicate.

Plant establishment increased from 28 June to 12 July across all machines and soil types, except the John Deere Conserva Pak® in the pale sand which stayed roughly the same. The John Deere 1890 Disc Machine® had the highest plant establishment counts

at 12 July in both the loamy sand and the heavier (reddish brown) loam, but the lowest in the pale sand.

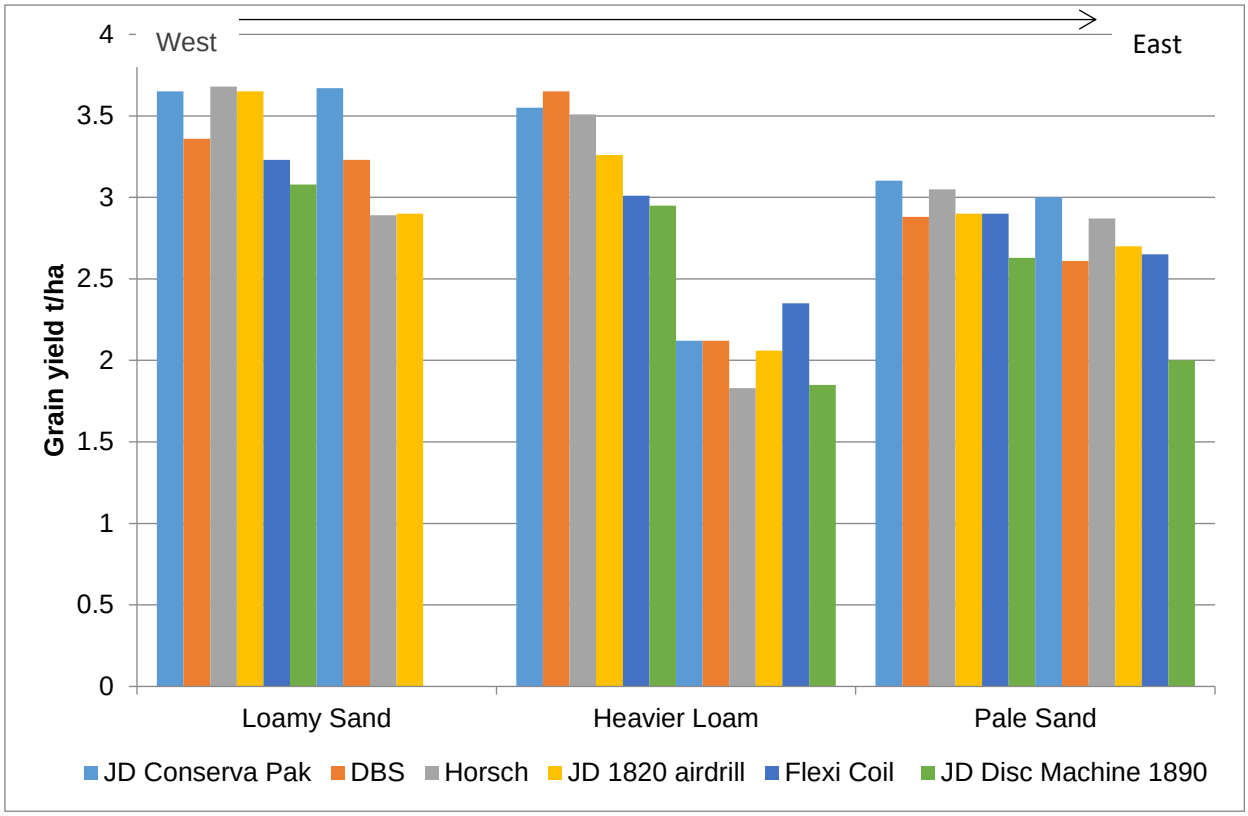

Figure 3. Grain yield results from each plot for Mace wheat (t/ha). **There was only one replicate of the Flexi Coil® and John Deere Disc Machine® in the loamy sand.

Figure 3 displays the yield results for every plot from the demonstration site, showing the general decrease in yield from west to east in the paddock. The second replicate of the heavier section yielded much lower than the first, and the yield map (Figure 4) shows it was a poorer section of the paddock in 2017. The pale sand produced the most consistent results across the two reps with the machines following the same trend in results; Conserva Pak® and Horsch® producing the top results, the Flexi Coil®, DBS® and John Deere 1820 Air Drill® all very similar in the middle and then the John Deere Disc machine® performing the lowest. Due to site variability and lack of randomisation these results do not possess a lot of integrity and machines cannot confidently be compared.

Conclusion

In summary, there were no large, consistent differences between the machines. Interestingly, the John Deere Disc Machine® had the highest plant counts in the sandy loam and heavier loam; however, yielded the lowest within each replicate in these zones. Site variability impacted the results, with the second replicate on the heavier section yielding much lower than the other soil types. For 2018, the growers plan to repeat this seeding machine demonstration on a different site and continue to use wheat as the comparison crop.

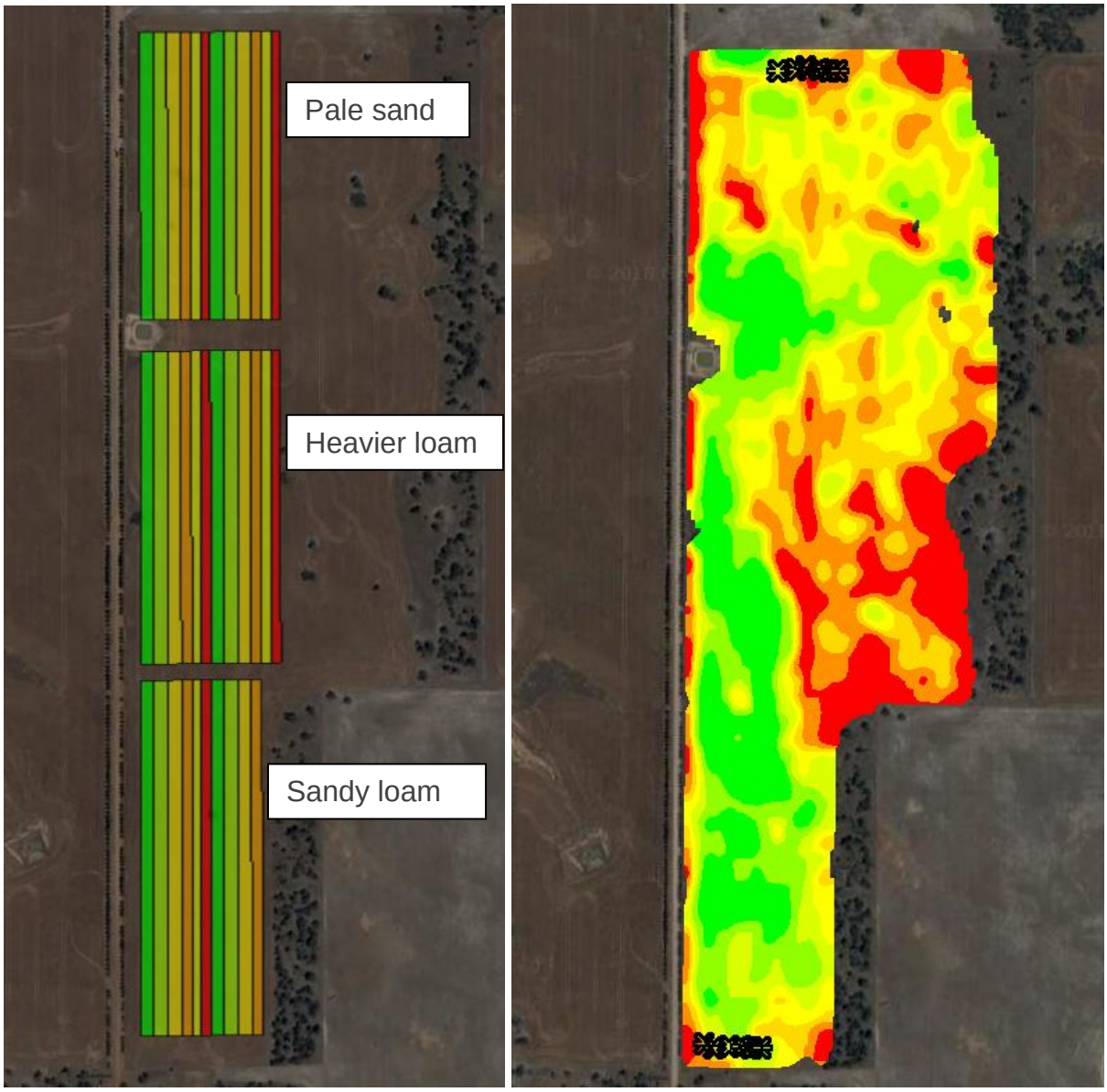

Figure 4. (Left) Trial layout, (Right) 2017 grain harvest yield map (obstacles outline where yield data for each treatment was collected).

Acknowledgments

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Important disclaimer