Nitrogen contribution of faba stubbles

Faba beans offer growers several advantages as a pulse crop:
1. Generally profitable as a grain crop
2. Grazing potential of the stubbles
3. N contribution as a high yielding pulse
4. Disease and weed break.

The variety trials over the seasons at the trial Block have seen biomass as high as 20 t DM/ha, which in theory could result in a contribution of up to 400 kg N/ha. Fabas as fodder/green manuring trials in 2013 saw fabas produce approximately 12 t/ha of biomass by mid August, with a resulting 157 kg N/ha measured in the following August under wheat. Another advantage of the N derived from stubbles is that it may be placed lower in the soil profile, making it less prone to microbial de-nitrification under waterlogged conditions as experienced in the winters of 2014 and 2015 where crop grown on fabas remained greener than that grown on cereal stubble and relying on artificial N.


2014 wheat crop on faba stubble in the foreground (87 kg N/ha 0-60cm) and on cereal stubble (37 kg N/ha 0-60 cm)

In an effort to quantify the N contribution, soil cores to 60 cm were taken prior to sowing and then through the spring on fallow that grew the 2016 faba bean variety trial that had an estimated 13 t/ha stubble load that was mulched and left on the surface, to monitor soil N.

The results
Soil testing prior to sowing showed soil nitrate levels of 76 kg N/ha (0-60 cm).
Soil test results from the spring period are presented in the following graph. Spring irrigation occurred on September 13th, September 30th and October 16th.

Fallow after fabas

(Chart: kg N/ha vs Date, 7-Sep to 12-Oct)

Legend: 0-10, 0-60
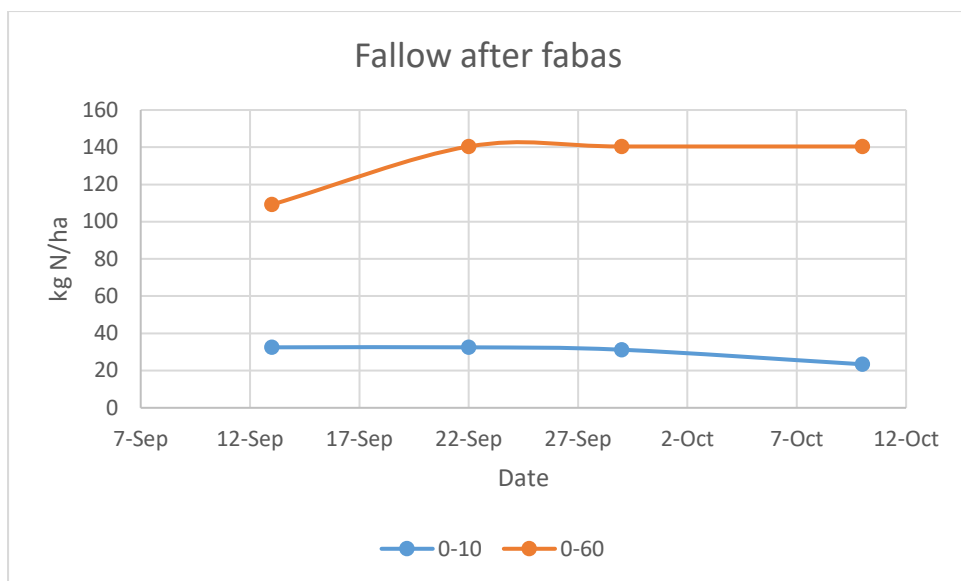
What does it mean?

Irrigation appears to have had little effect on soil N despite the waterlogging post irrigation. Soil N did not reach the theoretical maximum of 260 kg N/ha (given 13 t/ha stubble and 20 kg N generated by a tonne of pulse stubble). This is most likely due to the stubble being retained on the soil surface, and further N contribution will occur over time as stubble is broken down.

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