

# NATURE WORKS BEST

## SOYBEAN TRIAL 2021/2

### using DIY Instant Compost Tea

V3 - Mar 23

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#### Summary

**DIY Instant Compost Tea** was applied to soybeans to test effects on yield and soil. This tea is based on local soil biology and was brewed on farm. The tea was injected into the soil to boost fungal growth. The only extra costs are minor inputs into the tea and one pass of a tractor.

Soybean yields in the treated areas averaged 9% higher than the controls. This equated to an estimated \$190 increase in Gross Margin/ha. Better drainage and an increase in soil biology were recorded in photographs. Observations indicated a spreading of the soil biology into adjacent rows of the untreated area. Rows were 2 metres apart.

#### Trial details

The paddock had grown sugar cane for the previous four years and soybeans are used as a break-crop. The farm uses trash blanket, minimum till and controlled traffic practices, all part of regenerative agriculture. Controlled-traffic farming uses computers and satellites to steer machinery on designated tracks to minimise compaction.

Application of the DIY Instant Compost Tea @ 100L/ha and Sea Minerals @ 3L/ha required one pass by a tractor with coulters and 1,000-litre tank. The tea was applied at low pressure through pipes behind the coulters into the soil at about 10 cm deep.



Site 1 The compost tea was applied on 6 November 2020. Soybeans were planted on 12 January 2021 following normal practices and rates. The variety was Kuranda. The area had been fertilised with 150 kg/ha GF402 (7N:6P:32K:2S).

Site 2 The compost tea was applied on 23 December 2020. Soybeans were planted on 12 January 2021, using the same practices, rates and fertiliser.

#### Observations - Site 1

Following an irrigation with 45 mm of water on 17 February a visual inspection of possible effects of fungi was made six hours after the irrigation on 18 February – on adjacent rows!!

**6 hours after irrigation** – free water (light patch) in photo 1 - none in photo 2



**Photo 1 Control 6 hours after irrigation**  
**8 holes 30 cm deep showed water present**

**Photo 2 Compost Tea 6 hours after irrigation**  
**8 holes 30 cm deep showed NO water present**

Water present indicates poor soil drainage. Roots require water and oxygen to live and be active. Seeing water in the soil like the Control indicates lack of oxygen. If waterlogging is short term, say a few hours, it will restrict root function but cause little or no permanent damage. If it is days or weeks, it will kill roots. Lack of oxygen encourages the spread of root diseases like Phytophthora.

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A second inspection was made the next day on 19 February, 105 days after applying the first compost tea. Both times 8 holes were dug in the control and 8 in the treated areas – in adjacent rows.

**30 hours after irrigation** – once free water has drained, it leaves behind soil with good air.

**Photo 3**  
**Control 30 hours**  
**after irrigation.**  
**Top 10 cm with**  
**good air**



**Photo 4**  
**Compost Tea 30**  
**hours after**  
**irrigation.**  
**Top 30 cm with**  
**good air**



Surface soil-free areas on the shovels in photos 3 and 4 above – indicated by white lines - show the depth of well drained soil. This shows an increase of well-drained soil from 10 to 30 cm. The soil below 10 cm in photo 3 is still saturated, tight and too wet. Not shown in photo 4 is the surface crumbly, aerated structure for more than 30 cm. The presence of fine crumbles indicated active biology. (Too fine to be visible on these photos.)

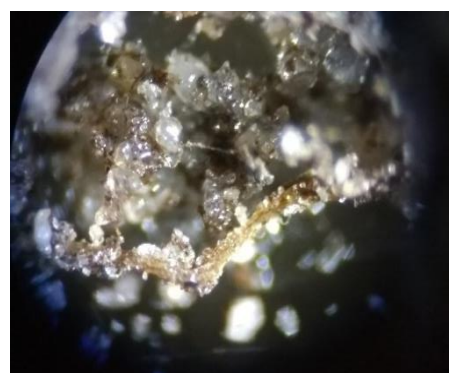
#### **Observations - Site 2**



**Photo 5 Pulled weeds:**  
**Left treated - Right control**



**Photo 6 Sand grains - control**



**Photo 7 Sand grains - treated**

Photo 5 taken at 26 April shows samples of weeds with significant soil adhering to roots. This adherence of soil to roots is a good indicator of biological activity in the rhizosphere.

Soil from the treated and control areas was then photographed under a microscope. Photo 6 shows grains of sand from the control soil with very clean sand particles. Photo 7 shows grains from the treated soil with dark stains and less light being reflected indicating the presence of humic compounds. The increased soil adhesion to roots and production of humic compounds on the sand grains indicate an increase in soil biological activity and organic carbon.

#### **Yield and Increase in Gross Margin/ha**

Yield samples were taken on 21 May, 150 days after application of the tea. Treated and control were hand-sampled with 8 replications, each 2 m of bed with 2 rows per bed. Samples from treated areas showed a 9.1% yield gain over those from untreated areas.

A 9% increase on 3.5 t/ha yield equates to 0.32 tonnes soybeans. At \$750/t this equates to an increase of income of \$240/ha. The cost of tea was \$20/ha and application about \$30/ha, giving an increase in Gross Margin of \$190/ha.

For full and lasting benefits, farming practices **must** be adjusted to protect and nurture the soil biology.

For details and further information: <https://tinyurl.com/mvecbpm2>

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