

## Research: Beans (*Phaseolus vulgaris* L.)

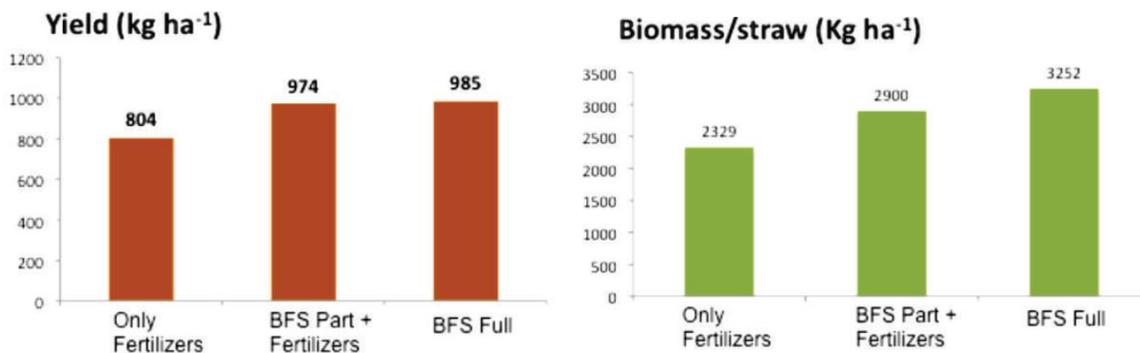
Common bean is an annual plant grown worldwide for its edible fresh green bean and dry seed while straw is used for fodder. Beans are legumes, so acquire their nitrogen through an association with rhizobium, nitrogen-fixing bacteria in soil. Nearly 20 million tones of dry common beans and 8 million tones of green beans are grown worldwide. Brazil, India and Mexico are some of the largest producers of dry beans while China produces the largest quantity of green beans.



### Nutrient Requirements

Bean belongs to Leguminosae family that can fix nitrogen from the atmosphere through the nodule on their roots. Phosphorous is required the most among the nutrients followed by potassium for this crop. Small amount of Nitrogen ( $20 \text{ kg ha}^{-1}$ ) is required if the soils are very low in nitrogen. Potassium is the second most important nutrient required by bean plant. However, in potassium rich soils the requirement can be low. Iron and Manganese are the other micronutrients required, if the soils are low in these nutrients.

Best Environmental Technologies conducted research trials in Mexico Canada to test the efficacy of Best Farming System (Best) for yield biomass production and soil quality parameters. Tests were conducted by government-accredited universities.



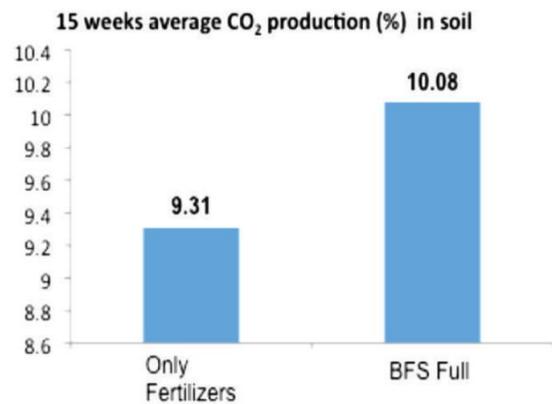
Best Farming System, in combination with recommended doses of fertilizers resulted in the highest production of grain yield and biomass (straw) when compared to the plots treated only with recommended amounts of fertilizers. Straw is very important in it fodder and for making farm compost.

Bean yield was increased by 72 kg per acre (22 %) in Best products treated crop with 1/3 of recommended fertilizers compared with only recommended amounts fertilizers treated crop. Biomass production was also increased by 40% over non-treated crop.



### Soil Quality

Soil quality is measured as soil microbial activity that is directly related to the amount of carbon dioxide released by microbes in soil as a result of their rapid growth and metabolic activities. It was measured using digital CO meter and corroborated with using NaOH capture method.



Co release was constantly higher in Best products treated plots during the 15-week measuring 2 period over the non treated soils and was 80% higher at week 7 and was 100% increase from week 14 to 15.

### Observations

- Early flowering was observed in the Best treated crop.
- BFS crops reached maturity 7 days before the non-treated crop.
- Best products treated crop showed resistance to moisture stress and leaf disease
- Soils in the Best treated plots showed higher residual nutrients in soil at the end of the crop compared to the non-treated plot soils.