POLYORGANIC TECHNOLOGIES
Home of Innovative Microbial Solutions

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DETONATION: 2018 CORN TRIAL

OBJECTIVE: To determine the effect Detonation has on Sweet Corn yield planted in Southeast Iowa. Trial also measured the phytotoxic response since Detonation was applied a second time and some foliar wetting occurred.

TREATMENTS:

1. Control: standard fertilization program with UAN 28 % – No Detonation
2. Treated Area: standard fertilization program (UAN 28 %) + Detonation @ 0.75 gal per Acre. Per the trial, Detonation was applied 2 times per crop cycle. The initial application was applied at time of planting as a soil drench. The second application was applied 4 weeks later. The second application was applied to both the soil and the foliage as a Sprench. For the second application, the water volume was increased to adequately reach soil surface as the canopy increased.

APPLICATION METHODOLOGY:

1. Detonation was applied through specially designed pivot irrigation system.
2. Method: Pivot application (12h one round)
3. Nozzle: 15PSI, 185 gal / 700 liters per hour (Flow meter)

ASSESSMENT METHODOLOGY:

1. Treatment area (Detonation) was harvested with a combine and weighed by means of mobile load cells in the field. Non treated area (Control) was harvested with a combine, weighed by means of mobile load cells in the field and compared to treated area.
2. Phytotoxicity was measured according to the Biologische Bundesanstalt (BBA) scale.

RESULTS AND DISCUSSION

1) DATA – INCREASED YIELD

When applied in conjunction with standard fertilization program, Detonation increased the yield.

Treatments	Bushels / Acre [A]	Increase Bushels / Acre	% Increase
Control	207.4	NA	NA
Detonation	224.3	16.9	8.15 %

The average yield for SE Iowa in 2018 was estimated to be 192 bushels per acre

2) PHYTOTOXICITY PER BBA SCALE

Detonation did not elicit a phytotoxic response in corn at applied rate.

Treatment	Control	Detonation

Rating	1	1

Biologische Bundesanstalt (BBA) phytotoxicity scale

Scale	Equivalent %	Comment/Observation
1	0%	No damage
2	0.1–2.5 %	Negligible damage
3	2.5-5.0 %	Moderate damage (no effect on yield/and or quality)
4	5.0-10 %	Damage up to limits of commercial acceptability – if no yield loss
5	10-15 %	Distinct damage (Commercially acceptable only under certain conditions – if no yield loss
6	15-25 %	Severe damage (not commercially acceptable – yield loss and quality)
7	25-35 %	Very severe damage
8	35-68%	Extreme damage
9	68-100%	Start of withering and death
		Plant Death

CONCLUSION

- Two applications of Detonation @ 0.75 gal per acre (applied 4 weeks apart) increased sweet corn yield by 16.9 bushels per acre or an increase of 8.15 % for this trial.
- Mechanism for yield increase appears to be due to N Fixation, Plant Growth Hormone Production, Nutrient Solubilization & Nutrient Mineralization.
- Detonation contains Paenibacillus polymyxa & Azospirillum lipoferum both of which are nitrogen fixing organisms. The increase in available nitrogen (NH_3) contributed to the increase in growth and yield.
- Detonation contains 5 species of Bacillus improves nutrient availability (solubilization of inorganic nutrients & mineralization of organic nutrients) and through production of plant growth hormones (phytohormones) which stimulate cytokinesis (cell division).
- Detonation also contains Trichoderma harzianum which also contributes to nutrient mineralization and nutrient solubilization (especially P)