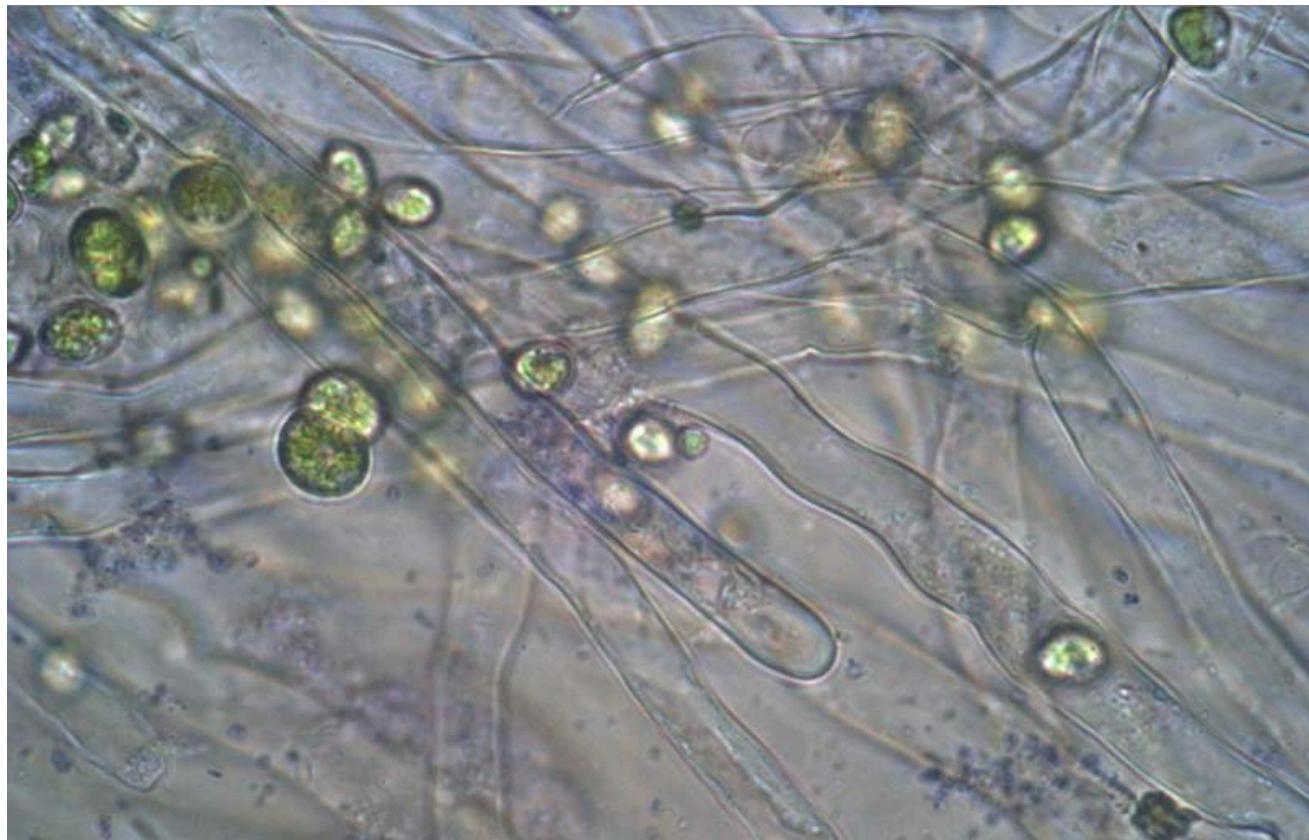


Rutgers University

**Laboratory Tests Using EnSoil Algae™ product in
Creeping Bluegrass (*Poa reptans*), Clover (*Trifolium
repens*) and Soybean (*Glycine max*)**



[Link to the Full Study Here](#)

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Methodology

- Seeds of *Poa reptans* were subjected to surface disinfection by shaking in a 3% sodium hypochlorite solution for 1 hr.
- Seeds of Clover (*Trifolium repens*) were surface disinfected for 1 hr by shaking in 3% sodium hypochlorite.
- Seeds of soybean were surface disinfected by sequentially treating with 70% ethanol for 2 minutes, followed by a 4% sodium hypochlorite solution for 2 minutes, and soaking in a 200 ug/mL streptomycin solution for 10 minutes.
- Seeds were subsequently placed onto agarose culture medium supplemented with varying concentrations of Algal product (0.01, 0.1, 1 and 5%). We used 3 or 4 replicates per treatment.
- Seeds on agarose were germinated and grown in lab ambient conditions for 8-10 days depending on the plant being tested.
- Nitro blue tetrazolium (for superoxide) and potassium permanganate (for ethylene) staining was done to visualize endophytic bacteria in plant cells.

Table 1. Stimulation of Root and Root Hair Growth in *Poa reptans* Through Application of Ensoil Algal Product at Various Concentrations in agarose-based 8-day seedling assays

	Germination Rate	Gravitropic Response	Lateral Root Number per plant	Root Length	Root hairs	Root Exudates
Control	80%	2	0.77	+	-	No
0.01%	90%	5	0.77	++	+	No
0.1%	87%	5	0.90	++	++	No
1%	80%	9	1.00	++	++	Yes
5%	90%	5	0.90	+++	++	Yes

Results

EnSoil Algae™ product application promoted seedling growth, exhibiting 6 positive growth promotional characters – germination, lateral root number, root length, root hair growth, root exudates and gravitropic response.

Table 2. Stimulation of Root and Root Hair Growth in Clover (*Trifolium repens*) Through Application of Ensoil Algae Product at Various Concentrations in agarose-based 8-day seedling assays

	Germination Rate	Gravitropic Response	Lateral Root Number per plant	Root Length	Root hairs
Control	83%	1	0.07	+	-
0.01%	90%	1	0.10	+	+
0.1%	90%	1	0.04	++	+
1%	87%	1	0.20	++	+
5%	97%	3	0.27	++	++

Results

EnSoil Algae™ product application promoted seedling growth, exhibiting 5 positive growth promotional characters – germination, lateral root number, root length, root hair growth, and gravitropic response. 5% product application performed best in seedling growth promotion.

Table 3. Stimulation of Root and Root Hair Growth in Soybean Through Application of Ensoil Algal Product at Various Concentrations in agarose-based 8-day seedling assays

	Germination Rate	Gravitropic Response	Root Length	Root hairs
Control	83%	5	+	+
0.01%	94%	14	+	+
0.1%	83%	6	+	+
1%	83%	8	++	++
5%	83%	6	++	++

Results

EnSoil Algae™ product application promoted seedling growth, exhibiting 4 positive growth promotional characters – germination, root length, root hair growth, and gravitropic response.

Conclusion

Based on the experimental results, the application of algae improves the growth of creeping bluegrass, clover, and soybean. The mechanism behind this phenomenon is attributed to the symbiotic interaction between algae and endophytic bacteria and plants, whereby the algae eject or release bacteria and facilitate the colonization of the plant roots. This, in turn, promotes the growth of root hairs, ultimately leading to an overall enhancement of plant growth.

