



**Performance of Kentucky Bluegrass with  
BioAktiv Treatment  
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This experiment was conducted using a Sassafras sandy loam soil of relatively low fertility. When the soil was collected it was screened of rocks and plant residues and amended with limestone and potassium fertilizer at recommended rates for turf establishment. After the soil was split into treatment groups, half of it was fertilized with phosphorus (P) fertilizer and half remained without P fertilizer. The treatments consisted of the following: 1) BioAktiv as recommended 2) BioAktiv as recommended + commercial P fertilizer 3) Commercial P fertilizer 4) Control without any treatment. Details of the experimental protocol are given in the original proposal.

The grass was seeded on January 31, 2014. Plant height was measured on Feb, 28, March 17, April 11, and April 21, of 2014. Grass clippings to measure growth at the 1 cm cutting height were collected on April 21, 2014. These clippings were dried and analyzed for mineral concentrations.



The grass exhibited a clear increase in growth in response to addition of P fertilizer compared to no added P. The BioAktiv treatments, combined with or without added P, exhibited less influence on plant growth as indicated by the height and clipping yield measurements. Visual observations at certain times during the experimental period suggested good density and turf vigor in response to the BioAktiv treatment. See attached photo. However, this is a subjective impression not fully validated by the height and clipping yield measurements.



Plant tissue analysis revealed some differences in mineral concentration in response P or BioAktiv treatment (see attached tables). Addition of P fertilizer significantly increased P concentration in grass tissue. BioAktiv had little influence of grass P concentration. Although all treatments received the same amount of applied N fertilizer, the BioAktiv treatment and the untreated control tended to have higher grass tissue N concentrations. Tissue N concentrations generally exhibit a positive relationship with grass color. There were no significant differences in concentrations of K, Mg, or Zn due to treatment. Concentrations of Ca in the grass tissue were increased when BioAktiv was added along with P fertilizer compared to P fertilizer alone. Concentrations of Fe, Mn, and Cu in the grass tissue tended to decrease where P fertilizer was added.



Turf grass establishment did respond to P fertilizer as may be expected based on previous research (Hamel and Heckman, 2006). The responses of BioAktiv were agronomically interesting and should be followed up with additional research on other crops. Because turf grass root length is difficult to evaluate, other crops may be more suitable for evaluating root growth responses. Future research should examine the effects of BioAktiv treatment on leaf chlorophyll content.

Reference:

Hamel, S.C. and J.R. Heckman. 2006. Predicting Need for Phosphorus Fertilizer by Soil Testing During Seeding of Cool Season Grasses. HortScience. 41:1690-1697

# Grass Height and Dry Weight 2014

Treatment	Feb 28 (cm)	March 17 (cm)	April 11 (cm)	April 21 (cm)	April 21 (g/pot)
BioAktiv	3.4	4.8	8.0	4.5	1.53
BioAktiv + P	3.7	6.8	9.4	5.1	1.98
P	3.5	7.0	9.8	5.1	1.92
Control	3.2	5.4	7.8	4.4	1.81

## K. Bluegrass Clippings Nutrient Analysis 2014

Treatment	Nitrogen (%)	Phosphorus (%)	Potassium (%)	Magnesium (%)	Calcium (g/pot)
Control	3.50 a	0.34 b	2.71 b	0.25 a	0.50 c
BioAktiv	3.63 a	0.36 b	2.88 ab	0.25 a	0.51 c
P	3.24 b	0.50 a	3.01 a	0.24 a	0.69 b
BioAktiv + P	3.36 b	0.49 a	2.86 ab	0.24 a	0.77 a
Statistics P<0.05	0.0001	0.0001	0.07	0.55	0.0001

## K. Bluegrass Clippings Nutrient Analysis 2014

Treatment	Iron (ppm)	Manganese (ppm)	Copper (ppm)	Zinc (ppm)	Sodium (ppm)
Control	101 a	87 a	14 a	60 a	1702 b
BioAktiv	92 b	75 a	15 a	63 a	1624 b
P	80 b	49 b	13 b	62 a	1974 ab
BioAktiv + P	84 b	46 b	12 c	60 a	3302 a
Statistics P<0.05	0.055	0.001	0.001	0.32	0.097



Treatments left to right:

- 1) BioAktiv as recommended
- 2) BioAktiv as recommended + Commercial P fertilizer
- 3) Commercial P fertilizer
- 4) Control without any treatment





