

SOIL HEALTH BENEFITS OF PRESCRIBED BURNING

AND FUTURE IMPLICATIONS

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PROJECT OVERVIEW

Prairie fires, both natural and prescribed, are used for a variety of reasons including changing the nutrient profile of the soil. Cover crop burning may add the correct balance of nutrients into the soil and reduce the need for compost or other soil additives.



Timeline



SEED

Seeded rye grass on September 27, 2022 and had a good stand before winter.



WAIT

Watched the grass grow summer of 2023. Mowed the grass a few times to prevent reseeding for the 2024 growing season.



BURN

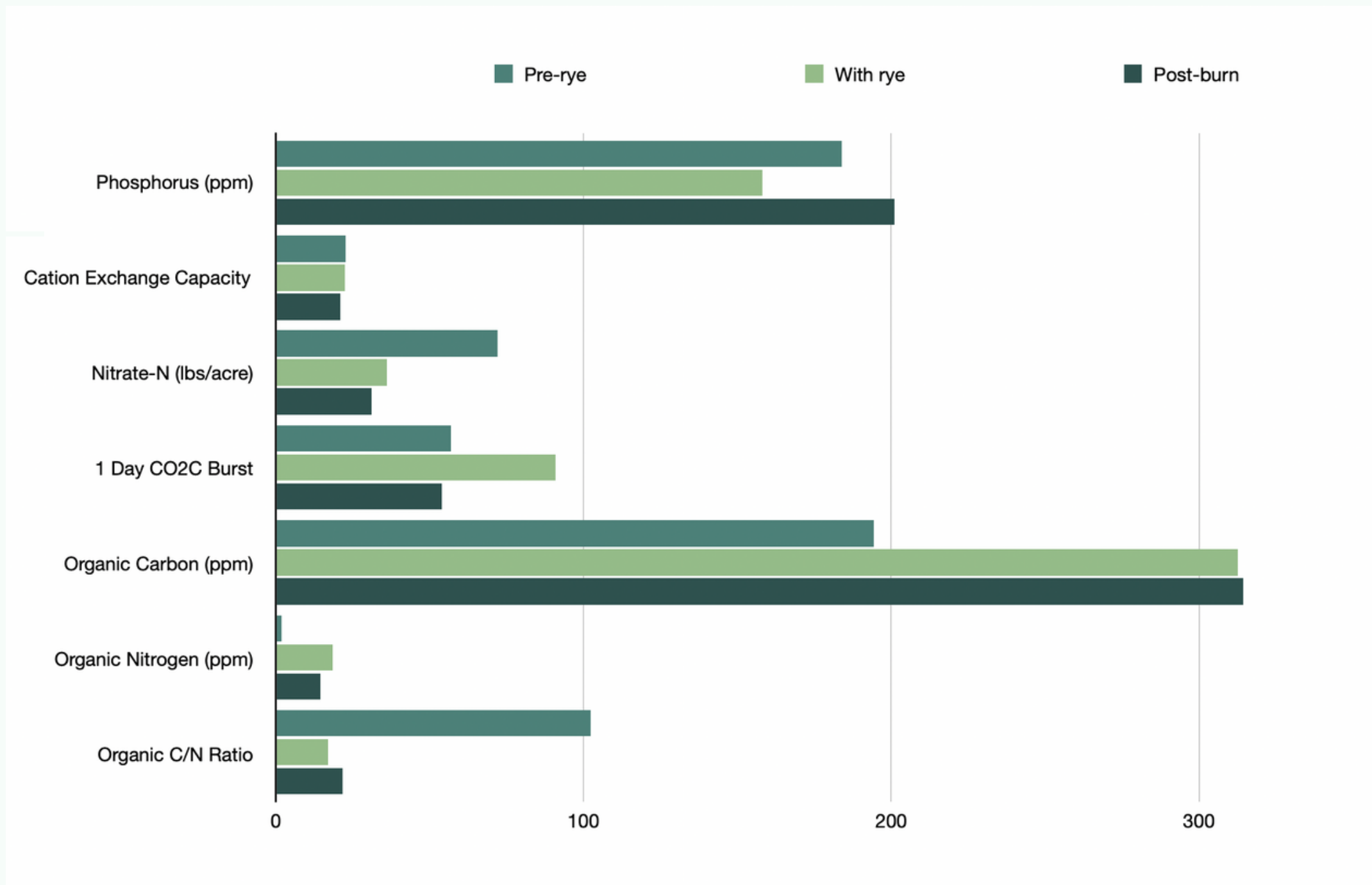
Burned the rye grass on November 10, 2023 with the help of the fire department.



SOIL TEST RESULTS

From Midwest Laboratories

- The CO₂ Burst test is very good indicator of soil health. This test measures the amount of CO₂ naturally released from the soil due to the activity of the soil microbes through microbial respiration. This test is very dependent on the amount of carbon that is available to the soil microbes and the form that the carbon is in. As the available carbon increases in your soil the Microbial respiration will increase.
- The Organic C/N ratio is a critical component of the nutrient cycle. A soil C/N ratio above 20 generally indicates that Nitrogen will be tied up and not available to plants. The ideal range for the Organic C/N ratio will be from 8:1 to 15:1.



	Phosphorus (ppm)	Cation Exchange Capacity	Nitrate-N (lbs/acre)	1 Day CO ₂ C Burst	Organic Carbon (ppm)	Organic Nitrogen (ppm)	Organic C/N Ratio
Pre-rye	184	22.8	72	57	194.4	1.9	102.3
With rye	158	22.4	36	91	312.5	18.4	17
Post-burn	201	20.9	31	54	314.4	14.5	21.7



Outcomes

DIFFERENT COVER CROP

Rye grass was not the best option.
We've now discovered better options.

LONG TERM SOIL HEALTH

We've established better long term
fertility instead of short term fertilizer.

CARBON AND NITROGEN RATIO

Improved ratio means more natural
microbial activity.

NO NUTRIENTS LOST

Nutrients did not literally go up in
smoke.

FUTURE APPLICATION

COVER CROPS

Value of cover crops. Utilizing diverse cover crops

FERTILITY VS. FERTILIZER

Long term value of fertility over short term value of fertilizer

WEED CONTROL

Future study on fire and weed control



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