

MSU AGRICULTURE INNOVATION DAY

FOCUS ON PRECISION

TECHNOLOGY THAT PAYS

Precision Soil Sampling: Every Farm Needs It!

Take Home Messages

Grid sampling is preferred to whole field soil sampling because it allows for management of smaller areas of the field.

Grid size of 2.5 acres is most common and is most cost effective.

Use smaller grid sizes (<2.5 acres) in fields to diagnose problem areas. Othwewise it is usually not cost effective.

The greatest benefit from grid soil sampling is usually variable rate lime application, where pockets of low pH can be adjusted without overapplying in high pH areas.

In combination with other tools (yield monitor data, soil type, soil conductivity), sampling by management zones can be an effective way to manage nutrient inputs to fields.



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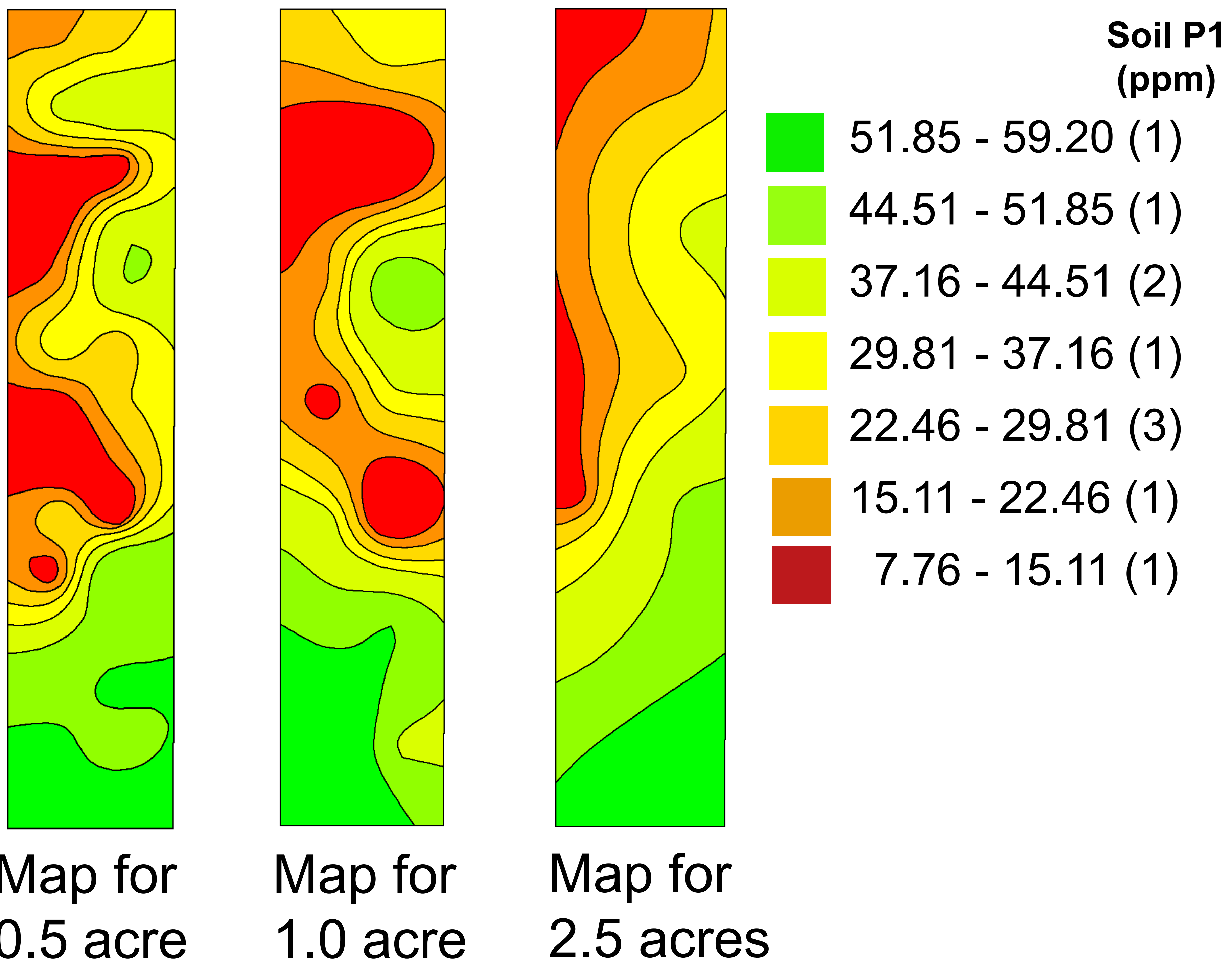
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Soil Phosphorus Sample Comparision



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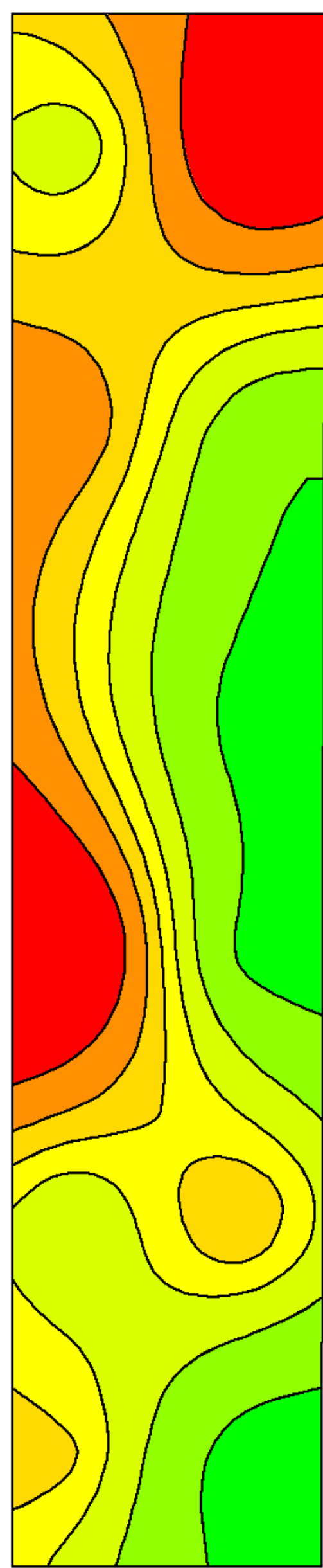
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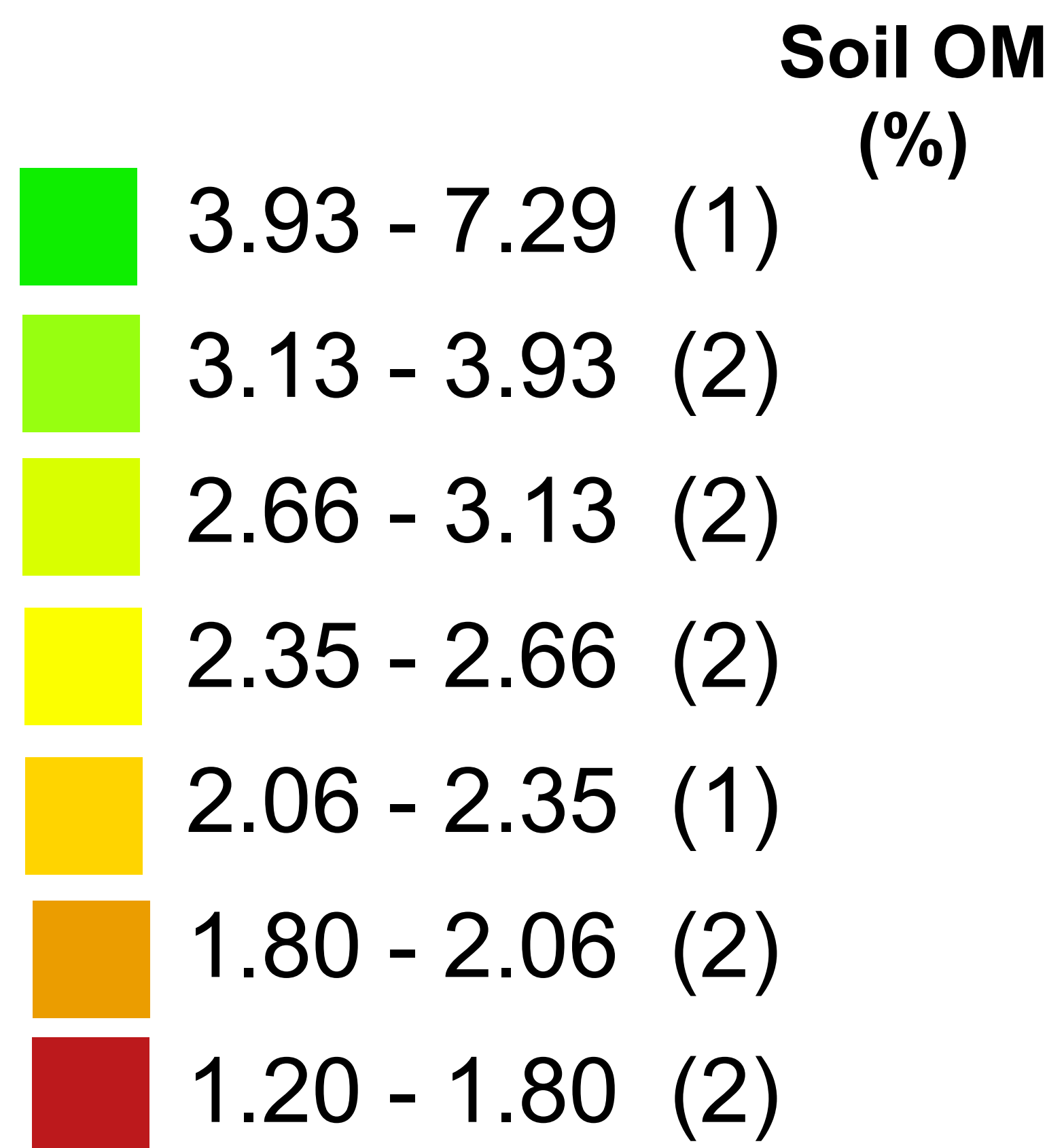
Soil Organic Matter Sample Comparison



Map for
0.5 acre



Map for
2.5 acres



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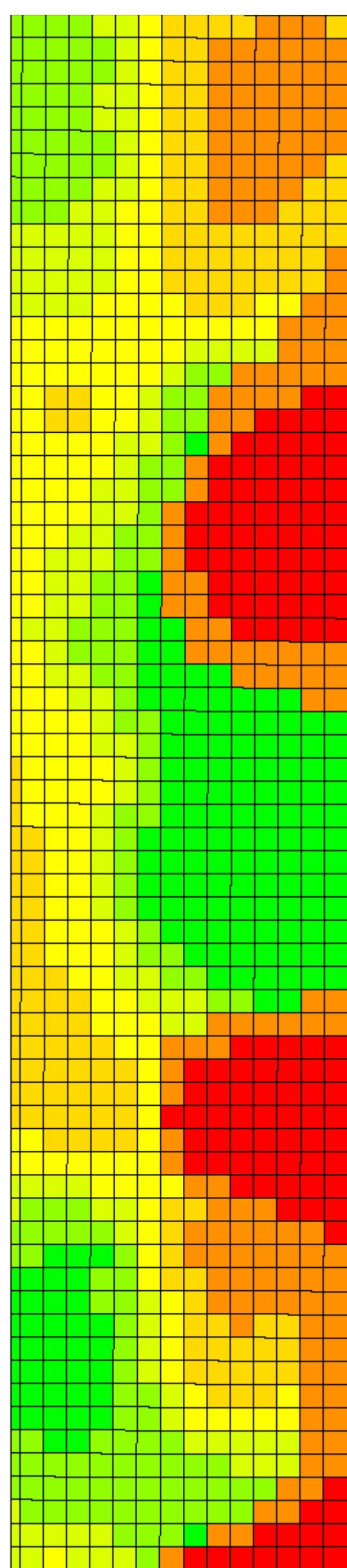
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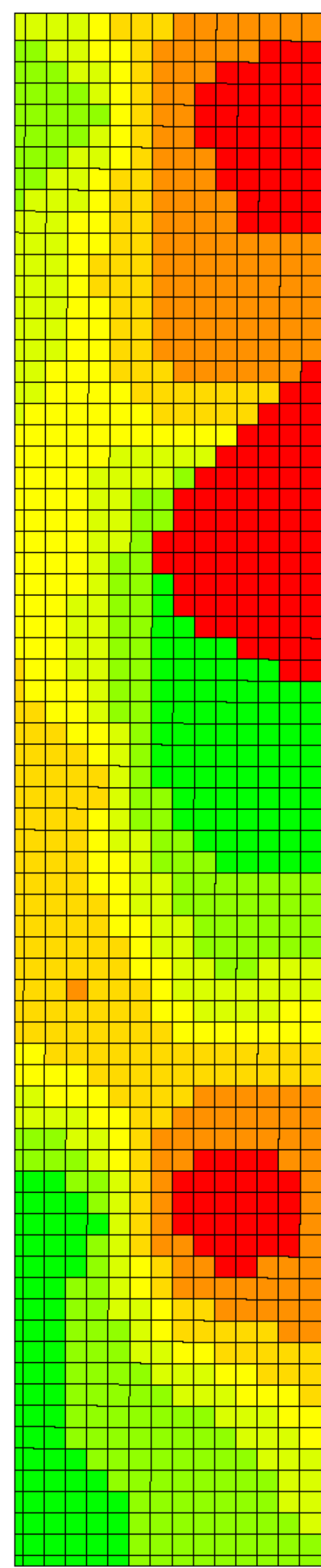
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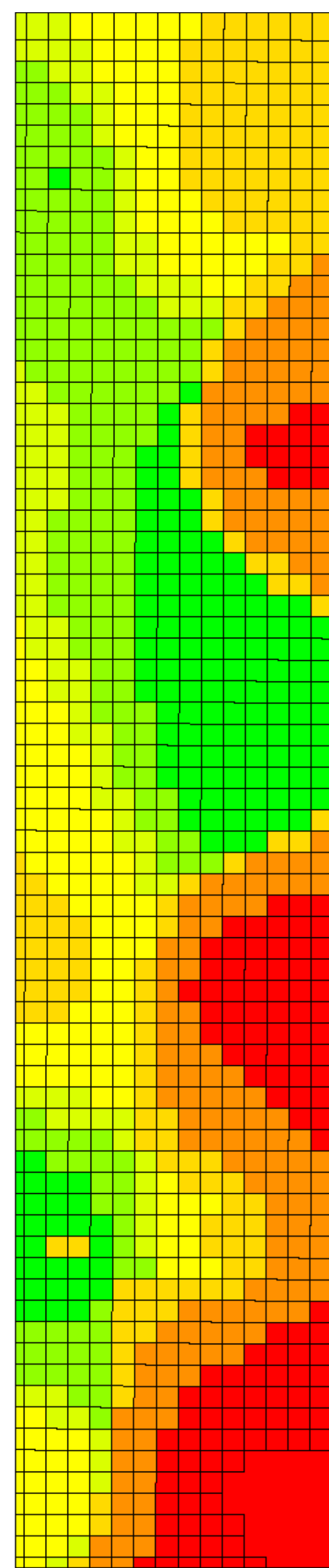
Soil Potash Sample Comparison



Map for
0.5 acre



Map for
1.0 acre



Map for
2.5 acres

Target Rate (Mass)
(lb/ac)



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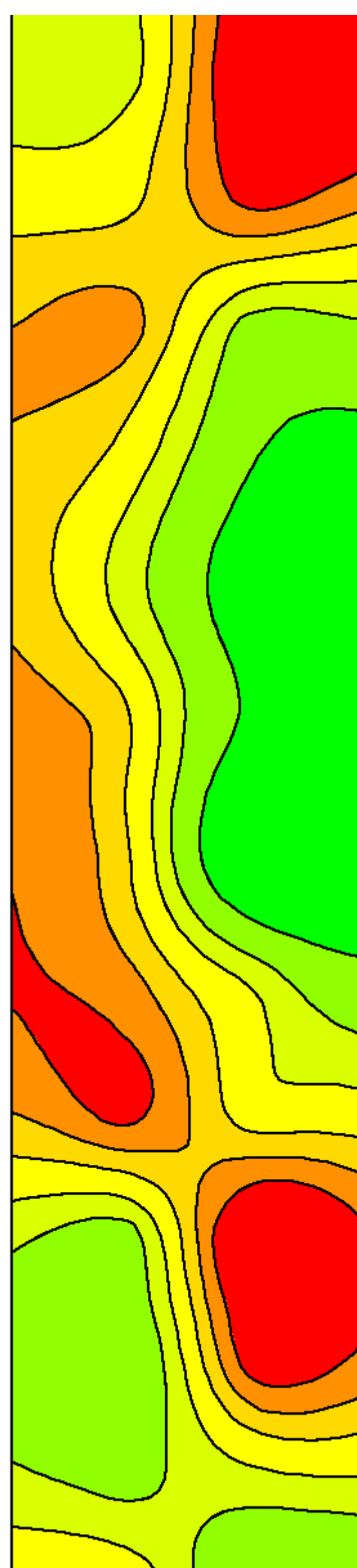
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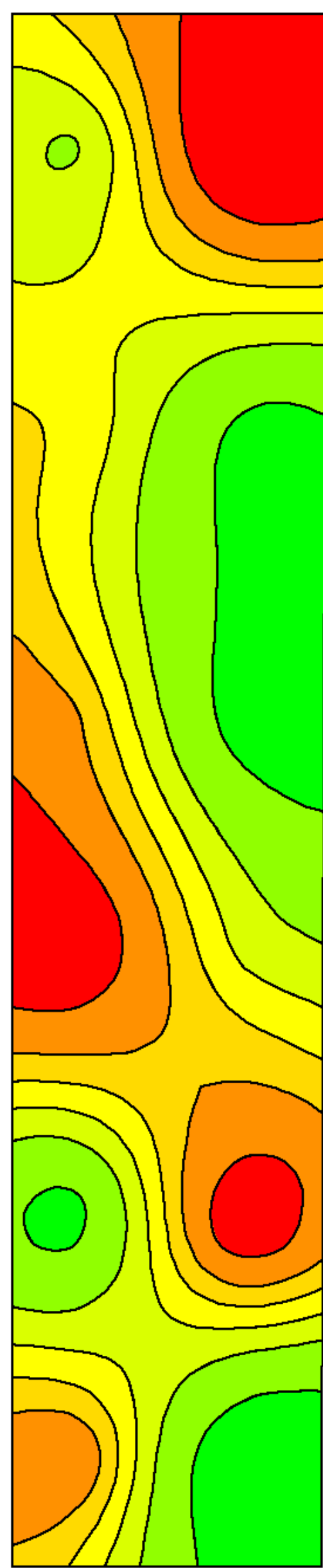
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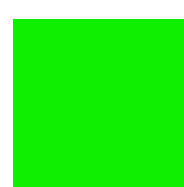

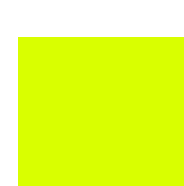
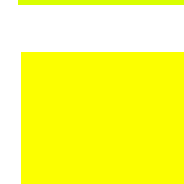



Cation Exchange Capacity (CEC) Sample Comparison



Map for
0.5 acre



Map for
2.5 acres

Soil CEC (meg/100g)	
	15.22 - 20.12 (2)
	13.17 - 15.22 (3)
	11.94 - 13.17 (3)
	10.60 - 11.94 (4)
	9.52 - 10.60 (2)
	8.42 - 9.52 (5)
	5.55 - 8.42 (3)



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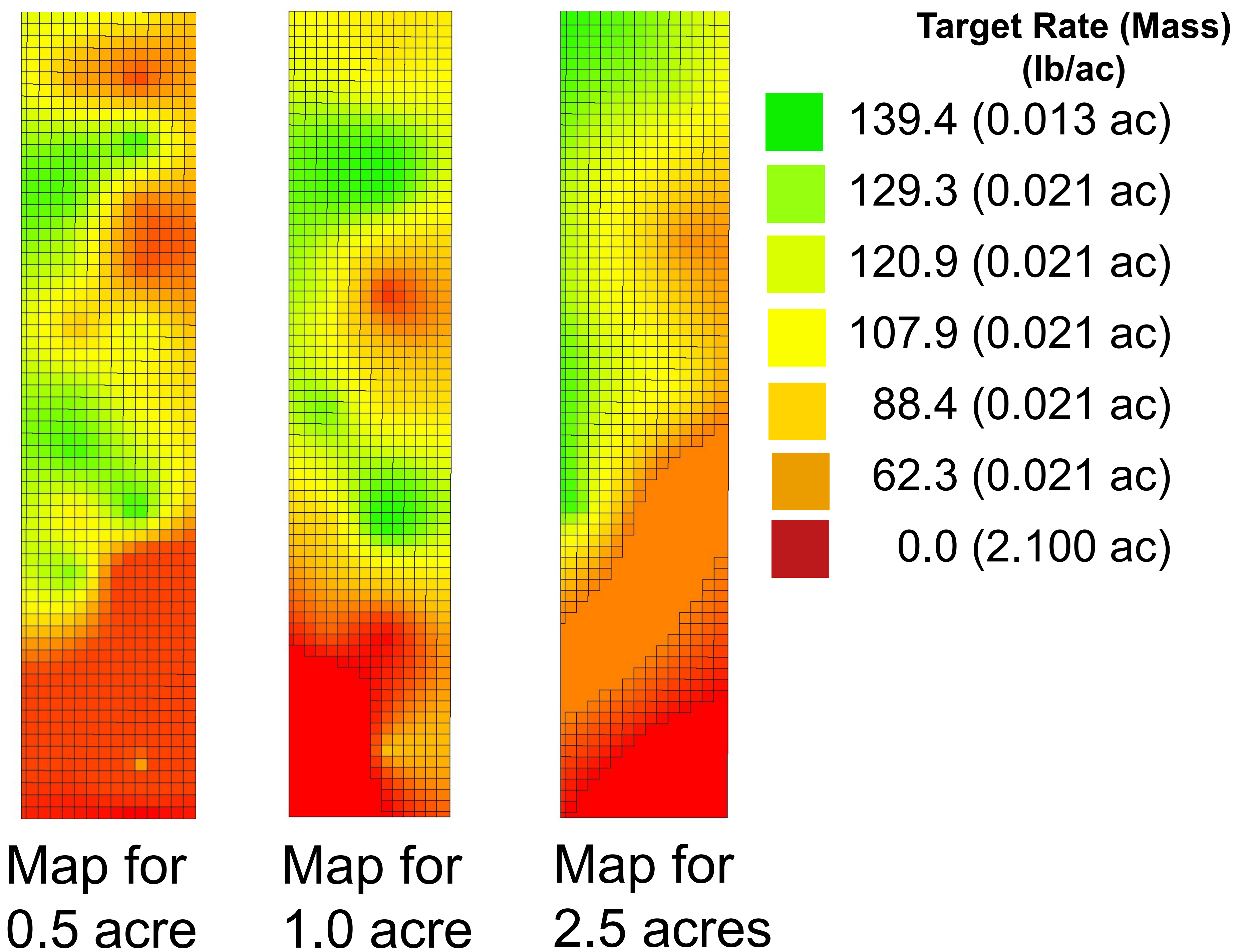
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Soil Monoammonium phosphate (MAP) Sample Comparison



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Grid Size	MAP (lbs)	Potash (lbs)	Fertilizer Cost	Annual Sampling Cost	Total Cost
0.5 acre	2017	3689	\$2,011.00	\$146.67	\$2,157.66
1.0 acre	2246	4118	\$2,242.47	\$88.00	\$2,330.47
2.5 acre	1804	3263	\$1,787.46	\$73.33	\$1,860.80
Whole Field	3313	1986	\$2,067.77	\$6.67	\$2,074.44

Amount of fertilizer applied to 22 acre test field.

In this field, the amount of fertilizer was reduced by identifying areas of higher soil test levels.

Half acre grids could also identify areas of lower soil test levels which would increase the amount of fertilizer applied.

Rates based on MSU E2904 bulletin recommendations.



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Fertilizer Cost Comparison

Fertilizer		
MAP	\$460 per Ton	\$0.44 per lb
Potash	\$364 per Ton	\$0.30 per lb

Sampling	Cost	Cost per year (3 years)
0.5 acre	\$20	\$6.67
1.0 acre	\$12	\$4.00
2.5 acre	\$10	\$3.33
Whole Field	\$20	\$6.67

Sample every 3 years



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