Our objectives are to develop dozen-soil-parameter calibration models based on VIS-NIR soil reflectance data measurements directly carried out in agricultural fields using the Real-time soil sensor, and to give these soil maps for the grower.

Contents

- Experimental Site
- Materials and Methods
- Results
  - Comparison with previous study
  - The scatter plots
  - The regression coefficients
  - Dozen-soil-parameter mapping
  - A case of decision making by the grower
- Conclusions

Experimental Site

- Located in Tokachi area
- Commercial farm
- Alluvial soil
- 10 fields 31.48 ha

Materials and Methods

- Operation speed is 0.56 m/s. Faster than custom speed (0.28 m/s).
- Wavelength: 350 nm - 1,700 nm

Procedure of Soil Sampling and Calibration

- Soil sampling at a depth of 0.2 m
- Converted to the soil absorbance spectra
- Criterion variable
- Explanatory variable
RESULTS

Comparison of the sensitivity analysis result.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Calibration</th>
<th>Variation</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>0.87</td>
<td>0.76</td>
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<td>pH (%)</td>
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<td>MC (%)</td>
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<td>0.96</td>
<td>1.23</td>
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<td>SOM (%)</td>
<td>0.96</td>
<td>0.92</td>
<td>0.30</td>
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<tr>
<td>TC (%)</td>
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<td>0.95</td>
<td>0.26</td>
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<tr>
<td>EC (mS/cm)</td>
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<td>0.80</td>
<td>0.016</td>
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<tr>
<td>CEC</td>
<td>0.96</td>
<td>0.96</td>
<td>1.26</td>
</tr>
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<td>CEC (%)</td>
<td>0.96</td>
<td>0.96</td>
<td></td>
</tr>
</tbody>
</table>

The Scatter Plots on dozen-soil-parameter

The Regression Coefficients (standard curve)
This is a case of field No.3 in 2009.

Dozen-soil-parameter Mapping

- Measured data
- Predicted data

Dozen-soil-parameter Calibration models were developed using multivariate regression.

- The sensitivity analysis for dozen-soil parameter was obtained almost the same result with previous study.

- A major result of this study was accepted by the grower as one of decision-making support tool.

Conclusions

A case of Decision Making by the Grower

- Distributed the powdered sulfur, like this.
- Octover, 2007
- December, 2008
- November, 2009
- May, 2009

- Spilled a large amount of the lime fertilizer

What happen in the field?

The grower is having some remembrance.

Field No.3

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