Subsoil Quality

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Subsoil Quality

- Nutrient Availability
- Water Availability
- Resistance
- Porosity
Factors Influencing Subsoil Quality

Soil Formation
Rotation
Tillage
# Soil Depth and Soil Productivity

<table>
<thead>
<tr>
<th>Soil Depth (ft)</th>
<th>Relative productivity (%)</th>
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<tbody>
<tr>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
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<tr>
<td>3</td>
<td>75</td>
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<tr>
<td>4</td>
<td>85</td>
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<tr>
<td>6</td>
<td>100</td>
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Total water content as a function of depth to bedrock
Sept. 6, 2014 Asotin, WA

\[ y = 1.59x + 4.44 \]
\[ R^2 = 0.97 \]
Impacts of Soil Formation, Century-Long Tilled Wheat Farming

Compacted Layers due to:

Rodweeding R
Glacier: G

Taylor Beard, Dennis Roe
Canola Root “J” Hooking: Physical Impedance of Tap Root

Impacts of Soil Formation, Century-Long Tilled Wheat Farming
Nutrient Cycling During 125 Years Wheat Farming

Surface recycling of soil immobile nutrients: e.g. Phosphorus, Boron, Silicon

Implications:
• Subsoil deficiencies lead to inadequate late season P and B uptake as surface dries.
• Surface Si accumulation contributes to crusting and compaction
Soil Immobile Nutrients:
- Phosphorus
- Boron

Severe subsoil deficiencies require new rotations (or earthworms) that recycle deep nutrients

Soil Mobile Nutrients:
- Nitrate-N
- Sulfate-S

Mobile nutrient recovery requires deep rooted crops

Stranded during dry summer
As we enter the era of UAS evaluation of the health of your cropping system from 400 ft above, don’t forget that it’s all about the 6 ft of soil below.