Development of Grasshopper for automated grass measurement

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1 - GPS Map Created and Stored for Each Paddock
2 - Calculate Grass Height & Density in Hectare
3 - Input Additional Information Required for Calculation
4 - Generate Recommended Grazing Area and Locate with GPS
5 - Integration with PastureBase Ireland

Satellite - GPS
Data via Bluetooth to Smart Phone APP
- Grass Height
- Grass Density

Grazing Allocation

Animal Demand (DM/day)
Dry Matter (%)
Number of Animals

PastureBase Ireland

The Irish Agriculture and Food Development Authority
The Grasshopper Mk 1
Validation Correlation Graph

### Pearson Correlation

<table>
<thead>
<tr>
<th></th>
<th>Pipe v Jenquip</th>
<th>Pipe v GrassHopper</th>
<th>Jenquip v GrassHopper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>p value</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operator 1</strong></td>
<td>0.9997</td>
<td>&lt;0.0001</td>
<td>0.9998</td>
</tr>
<tr>
<td><strong>Operator 2</strong></td>
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<td>&lt;0.0001</td>
<td>0.9995</td>
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<tr>
<td><strong>Operator 3</strong></td>
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<td>&lt;0.0001</td>
<td>0.9998</td>
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</tbody>
</table>

### Validation Statistics

<table>
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<tr>
<th></th>
<th>stdev</th>
<th>Coefficient of Variation (%)</th>
<th>Difference Average</th>
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</thead>
<tbody>
<tr>
<td>Jenquip</td>
<td>1.77</td>
<td>0.031</td>
<td>-6.069</td>
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<tr>
<td>Grasshopper</td>
<td>1.64</td>
<td>0.020</td>
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<td>Improvement</td>
<td>0.133</td>
<td>0.011</td>
<td>2.39</td>
</tr>
</tbody>
</table>
App Development

Feature Set

- Easy to use – familiar interfaces
- Integrated with PastureBase
- Rich Information
- Usable with existing plate-meters
Integration with PastureBase will:

- Encourage PastureBase take-up
- Provide Growth Data at County or Regional Level
- Provide Historical Data for Analysis
Farm File Management allows the farmer to easily:

- Add or delete paddocks
- Change Residuals
- Change Herd Size / Allocations
- Include up-to-the-minute %DM
- Grazed Dates
- Soil Data
- Fertilizer Application Dates / Amounts
- Ground Scores ... and more.
Grassland Management

Paddock 14 Complete

HEIGHT          DMY

93 mm           1965 kg

NEXT PADDOCK

CLOSE FARM SURVEY

UPLOAD THIS SURVEY

NOW
(Mobile Data)

LATER
(WiFi / Cable)
Grassland Management

Grasshopper

Features:
- Easy to Use
- Robust
- Existing Plate Compatible
- Rich Data Set
- Auto Data Upload
- USB Recharge
Thank You
For your Attention