

Prototype Variable Rate Sprayer for Spot-Specific Application of Agrochemicals in Wild Blueberry

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The XVII CIGR World Congress
Meeting June, 2010



Nova Scotia
Agricultural
College

Background – Wild Blueberry

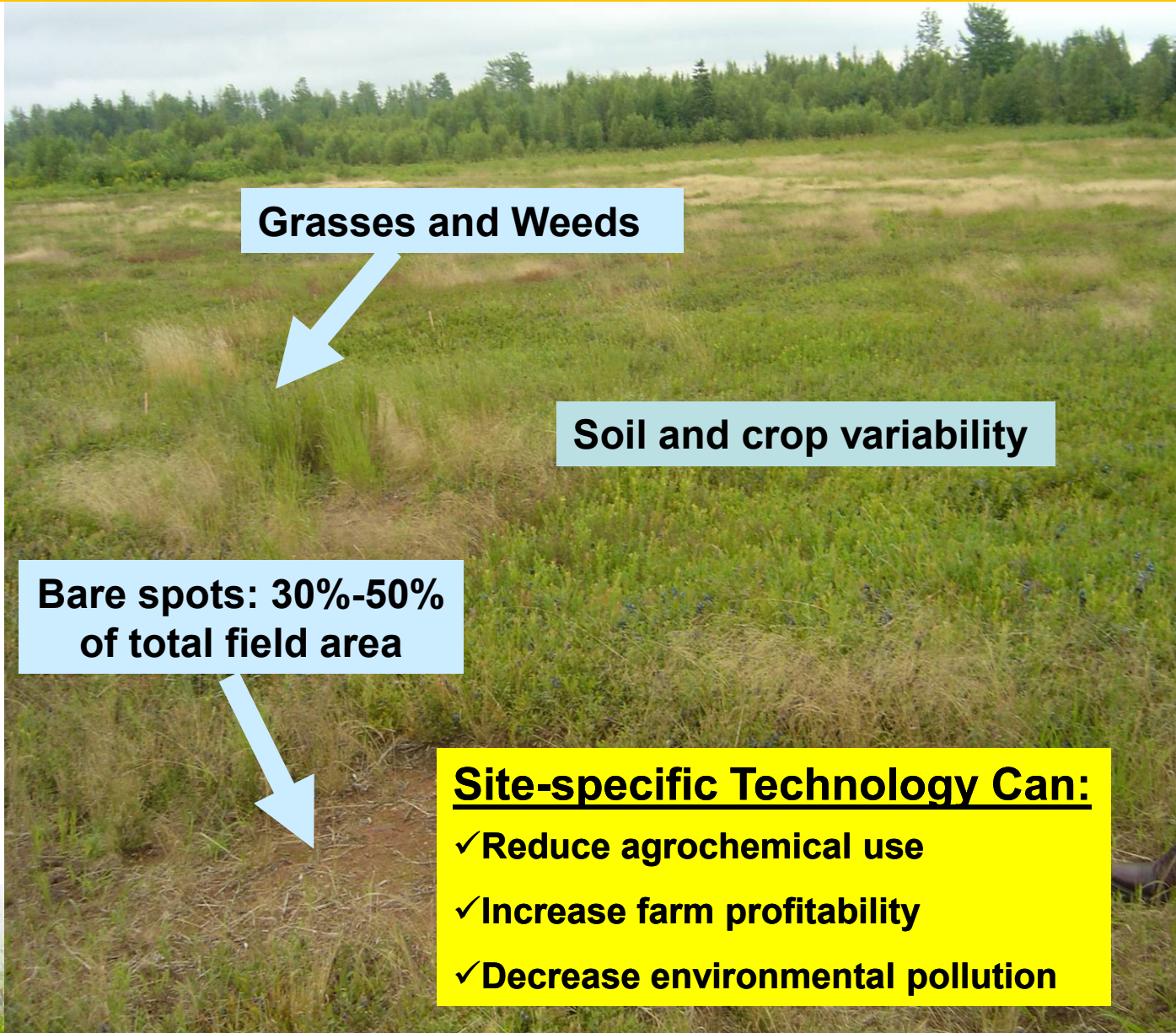
- Only grow in Eastern North America
- Unlike high bush cultivated blueberries, wild blueberries grow naturally.
- Wild blueberries spread by rhizomes under the soil.
- Grow on a two-year cycle. (one vegetative growth, and the other a fruit year)



www.fruitandveggie.com



Wild Blueberry Fields Need to be Managed Site-Specifically



Grasses and Weeds

Soil and crop variability

**Bare spots: 30%-50%
of total field area**

Site-specific Technology Can:

- ✓ Reduce agrochemical use
- ✓ Increase farm profitability
- ✓ Decrease environmental pollution

Cost-Effective Prototype Variable Rate Sprayer

Boom width = 20ft

Boom sections = 8 @ 2.5ft spacing

Boom height = 30in

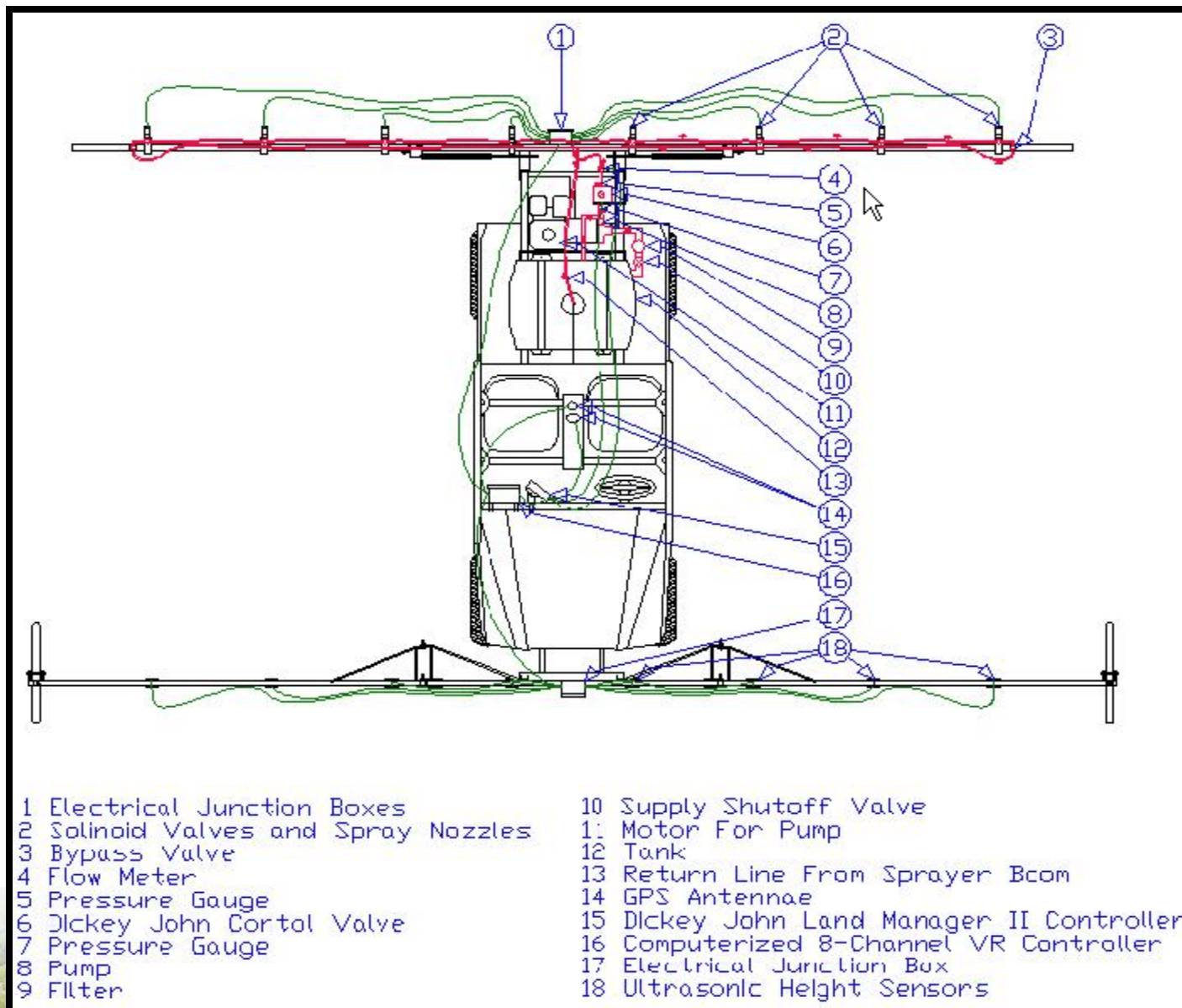
Each section = 1 ultrasonic/nozzle

8-channel computerized controller

DJ Land Manager II controller



Auto-CAD Diagram of Prototype VR Sprayer



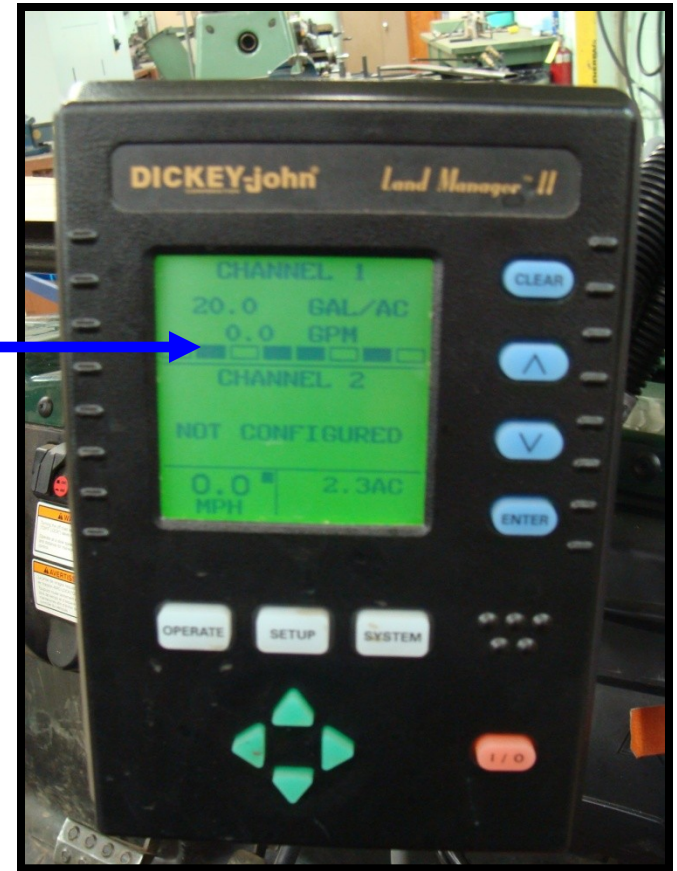
Controllers

Computerized 8-Channel Controller



Bluetooth® communication

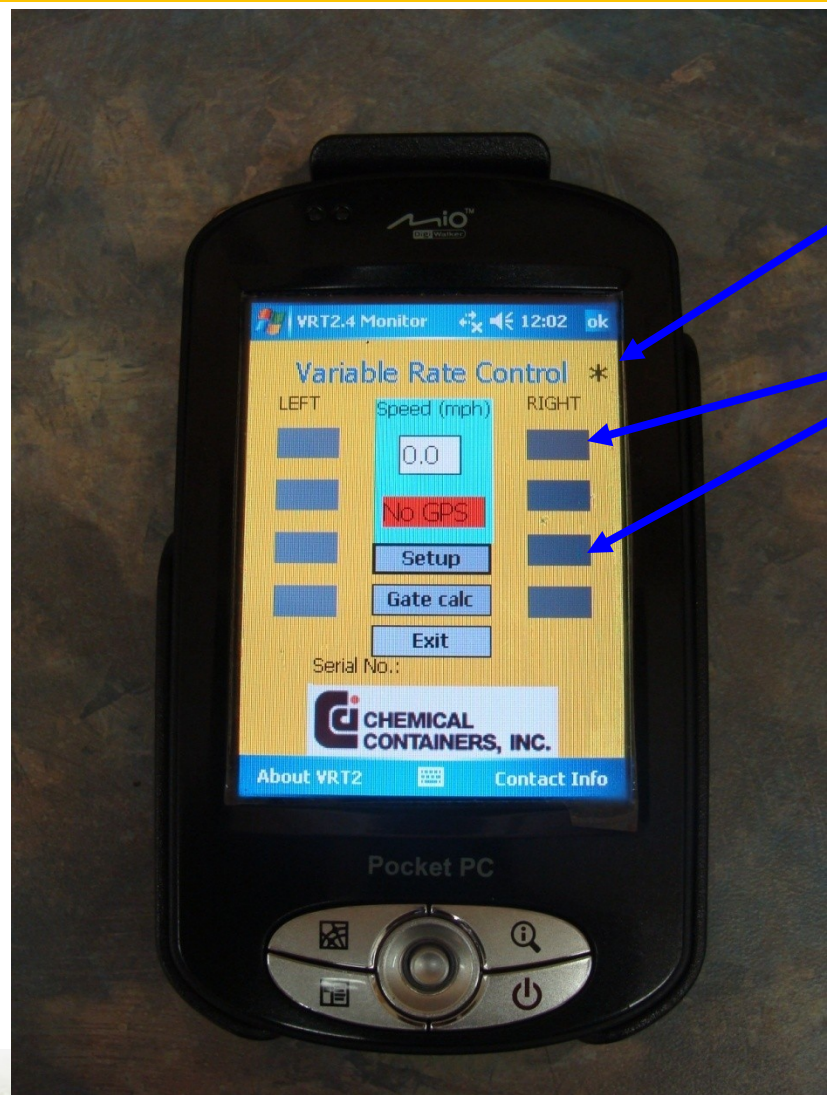
Dickey John Land Manager II Controller



Opened channel

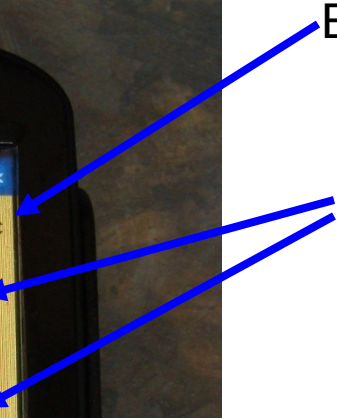


Pocket PC Featuring Variable Rate Control Program



Bluetooth

Channels



Pocket PC Set-up Screens

VRT2.4 Monitor

About VRT2 Contact Info

Variable Rate Control *

LEFT Speed (mph) RIGHT

0.0


No GP

Setup

Gate calc

Exit

Serial No.:



CHEMICAL CONTAINERS, INC.

VRT2 Setup

About VRT2 Contact Info

Calibration (secs): [] Page2

Sensor to discharge (inches): []

Front edge buffer (inches): []

Back edge buffer (inches): []

Manual speed (mph): []

Use startup buffer

Use manual speed

Max fertilizer for resets

Fill-in canopy sensing

Apply to all trees

Ignore resets

Resets only

Max spd: []

Program Go

Save

VRT2 Setup

About VRT2 Contact Info

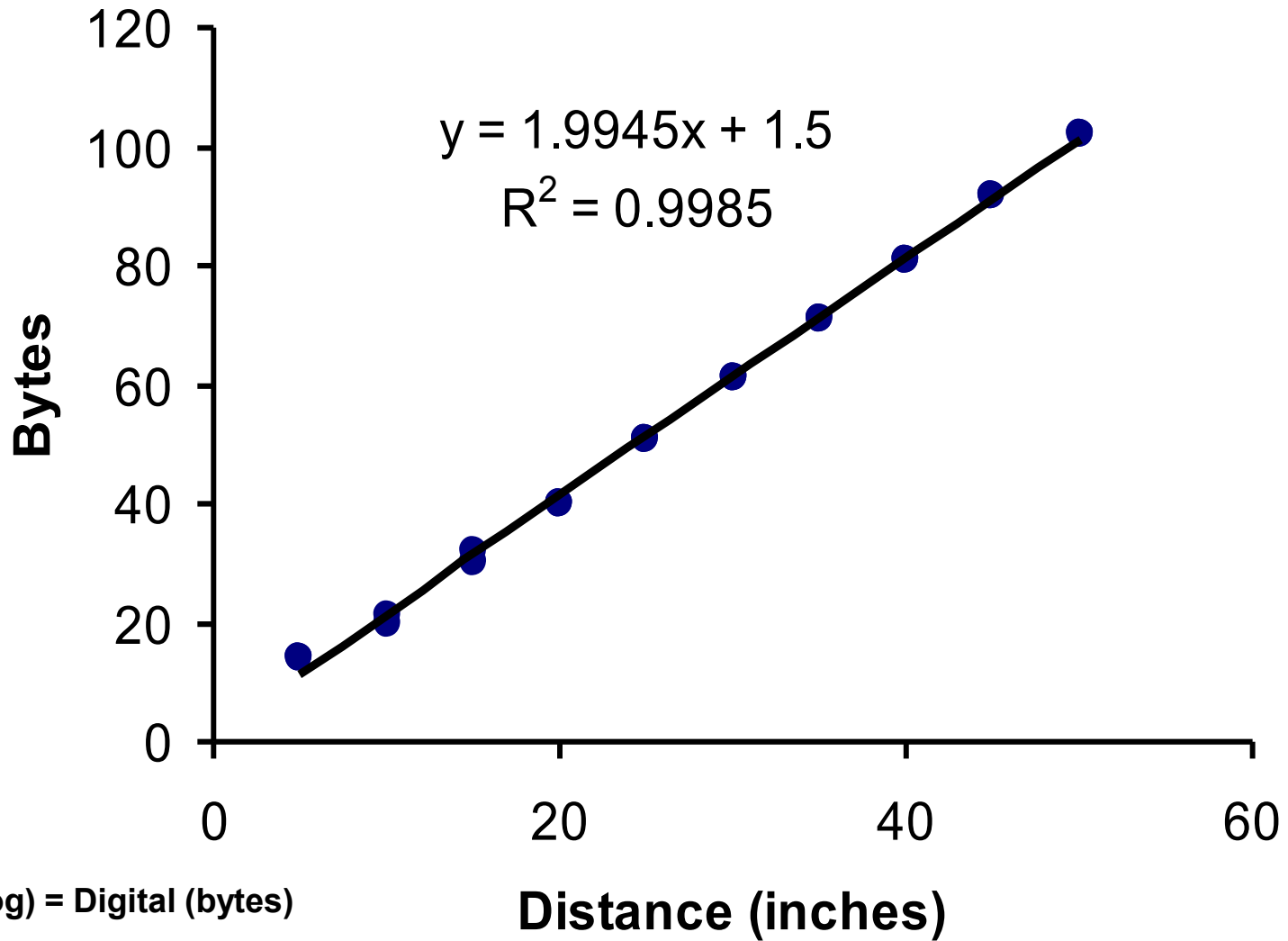
Com port: 8 Page1

Use distance sensors

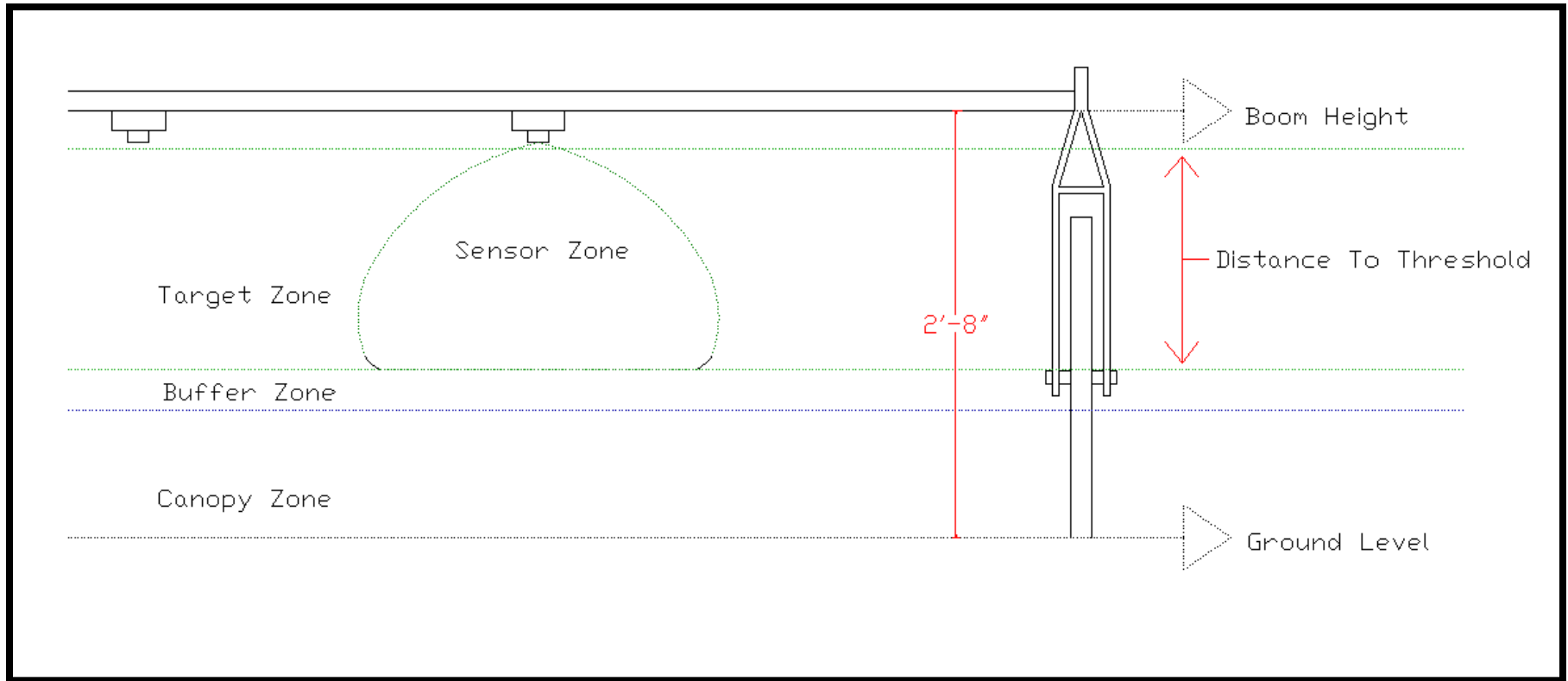
Distance threshold (inch): 19

Less than Greater than

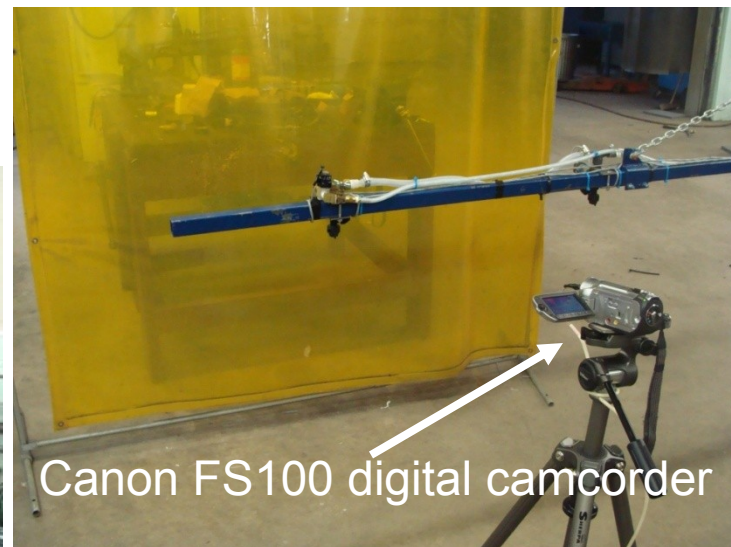
Ultrasonic Sensor Calibration



Look-Ahead Boom



Determining Mechanical Delay Time



Canon FS100 digital camcorder



Bulb



Delay in Real-Time



Video Frames Analysis



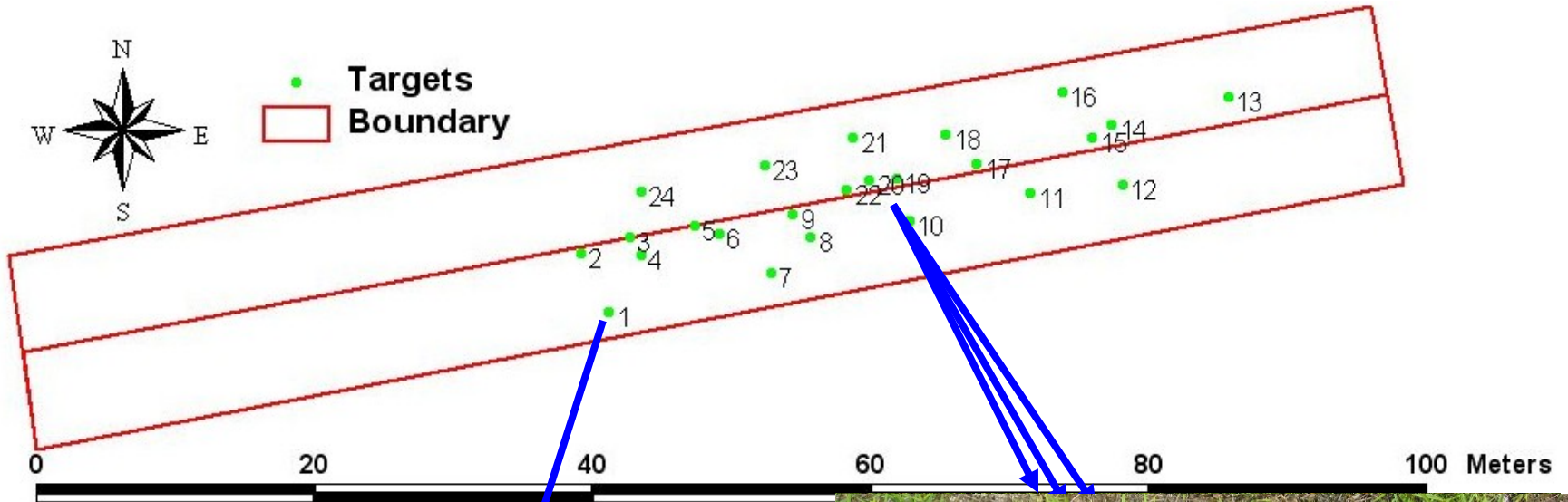
Dickey John Land Manager II Flow Rate Measurements



Video - VR Sprayer Testing in Hay Field



Variable Rate Sprayer Field Test (Goldenrod)



Video Clip - Uniform

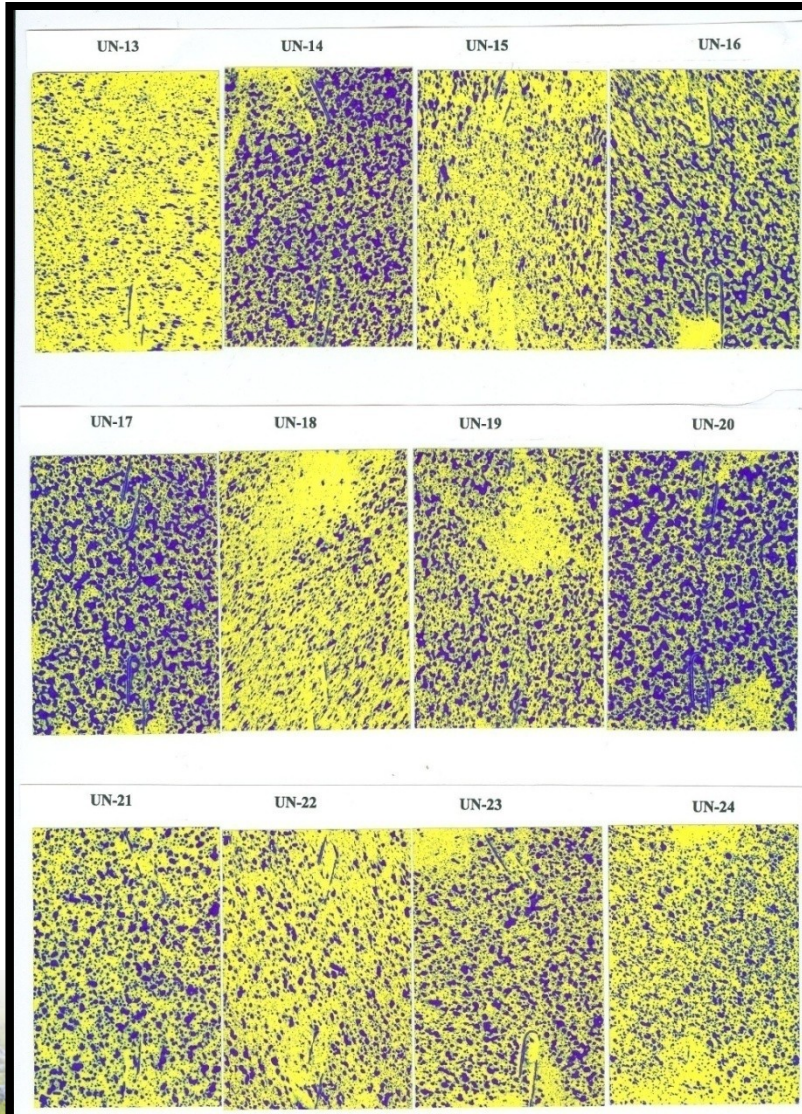


Video Clip - Variable Rate

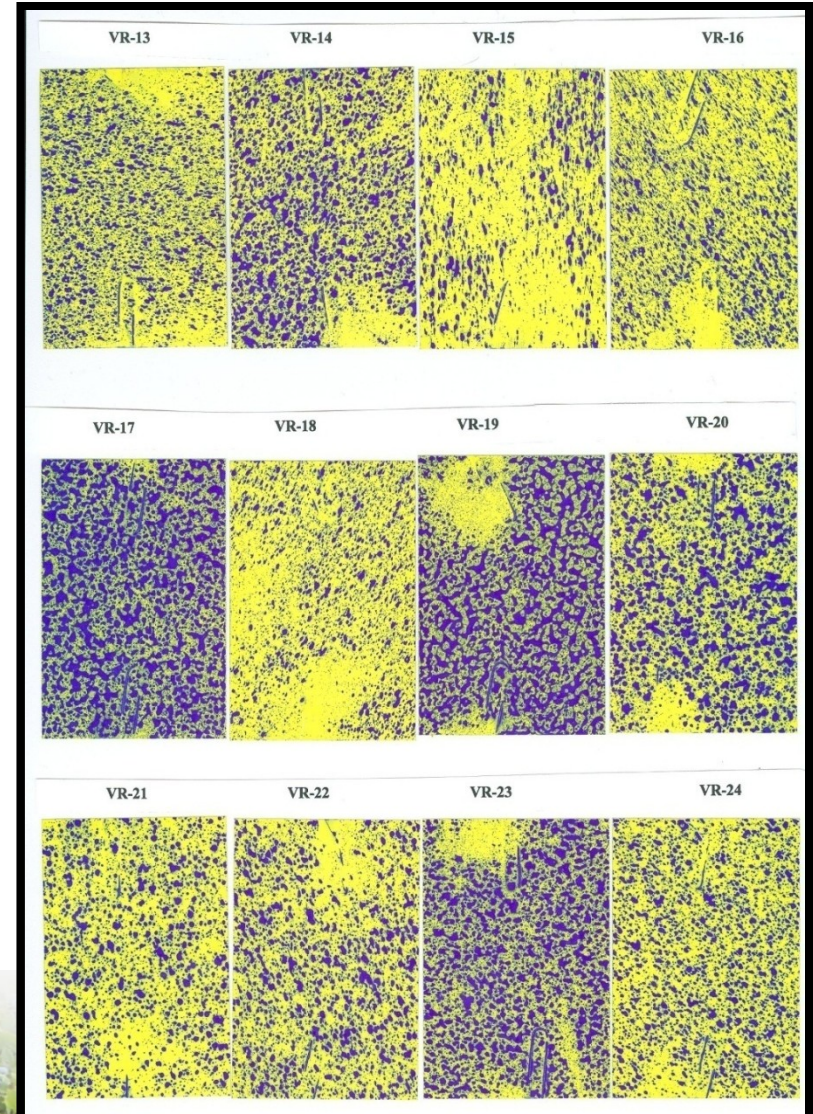


Water Sensitive Papers Coverage Results

Uniform



Variable Rate



Conclusions

- Easy user-friendly setup.
- Wireless convenience when using Pocket PC.
- Automatic flow & target compensation with changing ground speed.
- Manual speed input is possible in case of GPS signal outage.
- Adjustable front and back buffers for precise overlapping of agrochemical applications on targets.
- A single circuit board replaces multiple timers and electronic modules for greater reliability.
- Cost-effective.
- Accurate.
- Environmentally friendly.



ACKNOWLEDGEMENTS



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QUESTIONS?

