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

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• 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)
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
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
Controllers

Computerized 8-Channel Controller

Bluetooth® communication

Opened channel

Dickey John Land Manager II Controller
Pocket PC Featuring Variable Rate Control Program

### Variable Rate Control

- **Channels**
- **Bluetooth**

### Display Screen:

- **Variable Rate Control**
- **LEFT**
- **RIGHT**
- **Setup**
- **Gate calc**
- **Exit**

### Additional Information:

- Serial No.: [Chemical Containers, Inc.]
- About RRT2
- Contact Info
Pocket PC Set-up Screens

Variable Rate Control

- Speed (mph): 0.0
- No GP
- Setup
- Gate calc
- Exit

Serial No.: CHEMICAL CONTAINERS, INC.

VRT2 Setup

- Calibration (secs):
- Sensor to discharge (inches):
- Front edge buffer (inches):
- Back edge buffer (inches):
- Manual speed (mph):
- Use distance sensors
- Distance threshold (inch): 19
- Less than
- Greater than
- Program: Go
- Save
- Max spd:
Ultrasonic Sensor Calibration

Voltage (analog) = Digital (bytes)

\[ y = 1.9945x + 1.5 \]

\[ R^2 = 0.9985 \]
Look-Ahead Boom

- Target Zone
- Buffer Zone
- Canopy Zone

Sensor Zone

Distance To Threshold

Boom Height

2'-8''

Ground Level
Determining Mechanical Delay Time

Canon FS100 digital camcorder

Bulb
Delay in Real-Time
Video Frames Analysis
Video - VR Sprayer Testing in Hay Field
Variable Rate Sprayer Field Test (Goldenrod)
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.