Evaluation of a 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)
Site-specific Technology Can:
- Reduce agrochemical use
- Increase farm profitability
- Decrease environmental pollution

Wild Blueberry Fields Need to be Managed Site-Specifically

Grasses and Weeds

Soil and crop variability

Bare spots: 30%-50% of total field area
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
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)
Water Sensitive Papers Coverage Results

Uniform

Variable Rate
Relationship Between Weed Height and Area Coverage of the Target (Goldenrod)

**Track 1**
- Uniform: $R^2 = 0.75$
- Variable: $R^2 = 0.66$

**Track 2**
- Uniform: $R^2 = 0.83$
- Variable: $R^2 = 0.77$
Determine Sprayer Accuracy by Mapping Tall Weed Coverage (GPS)

Real-Time Kinematic DGPS Base Station
Comparison of Weed and Spray maps using RTK-GPS
VR Sprayer Evaluation in a Wild Blueberry Field Consisting of Fern, Grass, and Dogbane
Weeds and Spray Maps
Relationship Between Weed Height and Coverage Area of the Target (Fern, Grass, and Dogbane)

Track 1

(Variable) \( y = -2.6131x + 186.2 \)
\( R^2 = 0.66 \)

(Uniform) \( y = -3.3065x + 228.49 \)
\( R^2 = 0.75 \)

Track 2

Variable, \( y = -1.9885x + 159.34 \)
\( R^2 = 0.60 \)

Uniform, \( y = -1.651x + 139.79 \)
\( R^2 = 0.66 \)
Chemical Saving with Spot-Application

Test Tracks

Track 1
Track 2

Variable (L/ha)
Uniform (L/ha)
Weed area (%)
VR Saving (%)
Conclusions

- VR sprayer could be used for in-season spot application of agrochemicals in wild blueberry cropping systems to significantly reduce the amount of agrochemical usage
- Offers a huge cost saving for farmers
- Accurate.
- Environmentally friendly