SPRAYING EVOLUTION

**Speed Control**
Set the pump/flow at a constant and control the vehicle speed to achieve proper rate

**Pro:** Simple
**Con:** Any speed change makes rate per acre inaccurate. Pump speed variations affect spray pressure

**Flow Control**
Application flow is adjusted to maintain rate as sprayer speed changes

**Pro:** Rate per acre is very accurate
**Con:** Spray pressure and droplet size change as sprayer speed changes

**Flow and Pressure Control**
Control sprayer pump for flow and nozzle pressure

**Pro:** Wide speed and constant spray pattern
THE IMPORTANCE OF DROPLET SIZE

- Every chemical has a recommended droplet size
- Small droplets have the advantage of more “bullets” - may be prone to drift or evaporation
- Large droplets are less likely to drift - may roll off the plant which can lead to coverage problems.

DROPLET SIZE
IMPACT DROPLET SIZE MAY HAVE ON HERBICIDE EFFECTIVENESS
COVERAGE VS. DRIFT CONTROL

Notes:
1. Distances shown are meant to provide a general reference only. Other factors may affect droplet travel.
2. Results shown are extrapolation of a test where droplets were dropped from a given height under controlled conditions. During actual spray application the pressure used to spray will impart a velocity to the droplet which will reduce droplet travel distance. The reduction will depend on the pressure, droplet size and height.
3. All spray nozzles produce a range of droplet sizes and a range of droplet travel distances.
4. Air speed can result from wind or forward velocity of the sprayer.
5. Drift is directly proportional to height and wind speed.
   - At double the height the droplet travel distance will be double.
   - At double the wind speed the droplet distance will be double.

Based on spray drift information provided by Ohio State University - ohionline.ag.ohio-state.edu

HAWKEYE®

NOZZLE CONTROL SYSTEM
HAWKEYE® NOZZLE CONTROL SYSTEM

- Provides accurate application with a consistent spray pattern and droplet size at every nozzle while reducing spray drift
- Simple installation
- Easy setup and calibration

FEATURES AND BENEFITS

TURN COMPENSATION
- Standard feature
- Reduces over and under application

INDIVIDUAL VALVE DIAGNOSTICS
- Give operator instant feedback

OPTIMUM APPLICATION TRAVEL SPEED RANGE
- Displays on the run screen
HAWKEYE PRESSURE CONTROL

- Hawkeye offers the capability for the operator to enter two different spray pressure set points, and the ability to toggle between those two pressures on-the-go
- Pre-set pressures can be adjusted up or down at any time
- Why would you want pre-set pressure?

VIRTUAL SECTIONS

- Virtual section capability
- Up to 16
- Setup wizard makes it simple
Hawkeye™ HD

- Individual nozzle on/off
- Provides instant target spray pressure when nozzles are turned on
- Software unlock

Hawkeye™ HD MAPPING

7 SECTIONS
Seven sections on a sprayer are a common base system provided on factory installation

16 SECTIONS
The standard base Hawkeye system along with virtual section unlock provides 16 sections without additional boom valves needed.

72 SECTIONS
Upgrading to Hawkeye HD provides 72 sections reducing the amount of overlap.
HAWKEYE HD MAPPING

- Boom status bar shows green/red to indicate on/off
- Individual nozzles painted on Viper 4
- Rate calculated based on individual nozzles
- Coverage area based on individual nozzles
- As-applied map reflects individual nozzle on/off

HAWKEYE
PRESSURE CONTROL

With conventional or speed and pressure spraying, pressure control could be difficult to maintain which affects the droplet size.

10 GPA, 5 mph, 10 psi
10 GPA, 10 mph, 40 psi
10 GPA, 15 mph, 90 psi

**Hawkeye:**
Maintains targeted pressure for a consistent droplet size as speed changes

10 gal/acre 40 psi
8 mph
12 mph
15 mph
Hawkeye offers higher levels of precision control with up to individual nozzle control. As an example, the field shown in the map was sprayed using a sprayer equipped with Hawkeye HD:

With 72 sections (nozzle by nozzle):
Boundary Area = 141.6 acres
Applied Acres = 142 acres

HAWKEYE ROI

Comparison
120ft boom, 11 sections / 120ft boom, 97 sections (15 in spacing)

Chemical Cost
$8 per acre = $0.24 savings per acre
$12 per acre = $0.35 savings per acre
$15 per acre = $0.53 savings per acre

Time Savings
15 minutes = $187.50 revenue (based on $15 hr / 50 ac/hr)
## WHAT WILL HAWKEYE WORK WITH?

<table>
<thead>
<tr>
<th>Controller</th>
<th>Virtual Sections</th>
<th>Individual Nozzle On/Off</th>
<th>Direct Injection Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raven Viper 4</td>
<td>16</td>
<td>YES (105)</td>
<td>5</td>
</tr>
<tr>
<td>Case Pro 700</td>
<td>16</td>
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<td>1</td>
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<tr>
<td>NH Intelliview</td>
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<td>Ag Leader</td>
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<tr>
<td>John Deere 2630</td>
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</tbody>
</table>

**Application Controls and Input Management**

- Field Computers and Information Management
- Guidance and Steering
- Data Management
- Machine Controls

Unrestricted
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