Fluid Fertilizer Application
Improving Up-Time
Improving Accuracy

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Fluid Fertilizer Application

Improving Up-Time  Improving Accuracy

Application Equipment
  High Volume Applicators / Pre-plant Applicators
  Post Applicators
  Pull Type Applicators with Liquid Fertilizer
  Planters with Liquid Fertilizer
Fluid Fertilizer Application
Improving Up-Time     Improving Accuracy

Application Equipment
High Volume Applicators / Pre-plant Applicators
Fluid Fertilizer Application
Improving Up-Time    Improving Accuracy

High Volume Applicators / Pre-plant Applicators

Improving Up-Time

A. Pump
B. Plumbing
C. Flowmeter
D. Strainers
Fluid Fertilizer Application

Improving Up-Time        Improving Accuracy

High Volume Applicators / Pre-plant Applicators

Improving Up-Time

A. Pump –

1. Extreme Duty Seal
   a) Wet Seal w Sight Gauge
   b) Dry Seal w Vent Line

2. Stainless Impeller vs Poly Impeller

3. Hydraulic Motor
   a) Understanding the Control System Settings
   b) Min and Max PWM CAL numbers
   c) Preset PWM

B. Plumbing
C. Flowmeter
D. Strainers
Fluid Fertilizer Application
Improving Up-Time     Improving Accuracy

High Volume Applicators / Pre-plant Applicators

Improving Up-Time

A. Pump

B. Plumbing
   a) Wet Boom Stainless Plumbing vs Dry Boom
      a) Hose Routing – minimizing product setting
   b) Boom Dividers – improving product flow
   c) Replace End caps with Cam Lever Coupler
   d) Air Valves and Air hose blowout

C. Flowmeter-

D. Strainers
Fluid Fertilizer Application
Improving Up-Time  Improving Accuracy

High Volume Applicators / Pre-plant Applicators
  Improving Up-Time

  A. Pump
  B. Plumbing
  C. Flowmeter
      a) Standard Turbine Flowmeter for clear product
      b) Mag meter will handle everything
      c) Flush w water
  D. Strainers
Fluid Fertilizer Application

Improving Up-Time

Improving Accuracy

High Volume Applicators / Pre-plant Applicators

A. Pump
B. Plumbing
C. Flowmeter
   a) Standard Turbine Flowmeter for clear products
   b) Mag meter will handle everything
D. Strainers
Fluid Fertilizer Application

Improving Up-Time

Improving Accuracy

High Volume Applicators / Pre-plant Applicators

Improving Accuracy

A. Control System
B. Flowmeter
C. Variable Rate
D. Nozzle Selection
Fluid Fertilizer Application
Improving Up-Time    Improving Accuracy

High Volume Applicators / Pre-plant Applicators

  Improving Accuracy
  A.  Control System
     1.  SCS 440-ISO and Everything In between
     2.  CAL Numbers PWM valves to Valve CAL

  B.  Flowmeter

  C.  Variable Rate

  D.  Nozzle Selection
Fluid Fertilizer Application

Improving Up-Time  Improving Accuracy

High Volume Applicators / Pre-plant Applicators

Improving Accuracy
A. Control System
B. Flowmeter
   1. Turbine vs Magmeter
   2. Update Rate 1000hz vs 100hz
      1. Meter CAL 40 = 40 pulses in 10 gal
      2. Meter CAL 400 = 400 pulses in 10 gal
C. Variable Rate
D. Nozzle Selection
Fluid Fertilizer Application
Improving Up-Time    Improving Accuracy

High Volume Applicators / Pre-plant Applicators

Improving Accuracy
A. Control System
B. Flowmeter
C. Variable Rate
   1. Rate Zones have smooth transitions
   2. Does your controller offer a LOOK AHEAD for VR
   3. Test your machines rate change response
D. Nozzle Selection
Fluid Fertilizer Application
Improving Up-Time  Improving Accuracy

High Volume Applicators / Pre-plant Applicators

Improving Accuracy
A. Control System
B. Flowmeter
C. Variable Rate
D. Nozzle Selection
   1. Speed of Newer Machine
   2. GPM = New Nozzles
   3. Larger Nozzles = Lower PSI and Less Plugging
Fluid Fertilizer Application
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Post Applicators

Improving Up-Time

A. Pump
B. Plumbing
C. Flowmeter
D. Dry Check
Fluid Fertilizer Application

Improving Up-Time  Improving Accuracy

Post Applicators

Improving Up-Time
A. Pump
B. Plumbing
C. Flowmeter
D. Dry Check
Fluid Fertilizer Application
Improving Up-Time    Improving Accuracy

Post Applicators

Improving Up-Time
A. Pump
   A. HV pump vs Standard Volume
   B. Seals/ Impeller
B. Plumbing
C. Flowmeter
D. Dry Check
Fluid Fertilizer Application
Improving Up-Time   Improving Accuracy

Post Applicators

Improving Up-Time

A. Pump
B. Plumbing
   A. High volume vs Standard Plumbing
   B. Strainers
   C. Nozzle Bodies
   D. End boom flush valves
C. Flowmeter
D. Dry Check
Fluid Fertilizer Application

Improving Up-Time

Improving Accuracy

Post Applicators

Improving Up-Time

A. Pump
B. Plumbing
C. Flowmeter
   A. Min - Max GPM of a 120ft boom
   B. RFM 60 standard Plumbing
   C. MAG 200 3-200 GPM
   D. RFM 200-300 for HV
D. Dry Check
Fluid Fertilizer Application
Improving Up-Time     Improving Accuracy

Post Applicators

Improving Up-Time

A. Pump
B. Plumbing
C. Flowmeter
D. Dry Check
   A. Run Control System control valve
   B. Operate Boom Valves
Fluid Fertilizer Application
Improving Up-Time  Improving Accuracy

Post Applicators

Improving Accuracy
A. Control System
B. Flowmeter
C. Variable Rate
D. Nozzle Selection
Fluid Fertilizer Application

Improving Up-Time

Improving Accuracy

Post Applicators

Improving Accuracy

A. Control System
   A. Switching HV to Standard Volume
   B. Valve CAL
   C. PWM CAL
B. Flowmeter
C. Variable Rate
D. Nozzle Selection
Fluid Fertilizer Application

Improving Up-Time  Improving Accuracy

Post Applicators

Improving Accuracy

A. Control System
B. Flowmeter
   A. RFM 60- RFM 300
   B. MAG Meter
C. Variable Rate
D. Nozzle Selection
Fluid Fertilizer Application
Improving Up-Time       Improving Accuracy

Post Applicators

Improving Accuracy
A. Control System
B. Flowmeter
C. Variable Rate
   A. Capstan PWM
   B. Raven Hawkeye
   C. Variable Orifice Nozzles
D. Nozzle Selection
**Fluid Fertilizer Application**

**Improving Up-Time**

**Improving Accuracy**

Post Applicators

**Improving Accuracy**

A. Control System
B. Flowmeter
C. Variable Rate
D. Nozzle Selection
   A. PSI for Application
   B. Speed of New Machine
   C. AIM Command

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Application Equipment

High Volume Applicators / Pre-plant Applicators
Post Applicators
Pull Type Applicators with Liquid Fertilizer
Planters with Liquid Fertilizer
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Improving Up-Time

Pull Type Applicators with Liquid Fertilizer

Improving Up-Time

A. Pump
B. Plumbing
C. Flowmeter
D. Dry Check
Fluid Fertilizer Application
Improving Up-Time    Improving Accuracy

Pull Type Applicators with Liquid Fertilizer

Improving Up-Time

A. Pump
   A. Sizing the pump for the application
   B. Tractor Hydraulics % = GPM

B. Plumbing
C. Flowmeter
D. Dry Check
Fluid Fertilizer Application
Improving Up-Time      Improving Accuracy

Pull Type Applicators with Liquid Fertilizer

Improving Up-Time
A. Pump
B. Plumbing
   A. Placement of Tanks - on tractor or applicator
   B. Placement of Flowmeter 6-8” rule
   C. 3/8” hose 25 feet vs 1/2” hose = psi drop
C. Flowmeter
D. Dry Check
Fluid Fertilizer Application
Improving Up-Time      Improving Accuracy

Pull Type Applicators with Liquid Fertilizer

Improving Up-Time

A. Pump
B. Plumbing
   A. Feeding the pump
   B. Using a PSI relief
   C. Manifold to Row 3/8” hose vs 1/2” w less Back PSI
   D. Back Checks
C. Flowmeter
D. Dry Check
Fluid Fertilizer Application

Improving Up-Time    Improving Accuracy

Pull Type Applicators with Liquid Fertilizer

Improving Up-Time

A. Pump
B. Plumbing
C. Flowmeter
   A. Manifold Fittings
   B. Placement
D. Dry Check
Fluid Fertilizer Application
Improving Up-Time       Improving Accuracy

Pull Type Applicators with Liquid Fertilizer

Improving Up-Time
A. Pump
B. Plumbing
C. Flowmeter
D. Dry Check
   A. Run Control System control valve
   B. Operate Boom Valves
Fluid Fertilizer Application
Improving Up-Time      Improving Accuracy

Pull Type Applicators with Liquid Fertilizer

Improving Accuracy

A. Control System
   1. SCS 440-ISO and Everything In between
   2. CAL Numbers  PWM valves to Valve CAL

B. Flowmeter
C. Variable Rate
D. Nozzle Selection
Fluid Fertilizer Application

Improving Up-Time    Improving Accuracy

Pull Type Applicators with Liquid Fertilizer

Improving Accuracy

A. Control System
   A. 440-ISO
   B. Fine Tuning Control Valve

B. Flowmeter

C. Variable Rate

D. Nozzle Selection

E. Flow Monitor System
Fluid Fertilizer Application
Improving Up-Time 
Improving Accuracy

Pull Type Applicators with Liquid Fertilizer

Improving Accuracy
A. Control System
B. Flowmeter
   A. Placement of Flowmeter
   B. Keep it Full
C. Variable Rate
D. Nozzle Selection
E. Flow Monitor System
Fluid Fertilizer Application
Improving Up-Time    Improving Accuracy

Pull Type Applicators with Liquid Fertilizer

Improving Accuracy

A. Control System
B. Flowmeter
C. Variable Rate
   A. Controller Settings
   B. Capstan LF PWM
   C. Raven Hawkeye
   D. Variable Orifice Nozzles
Fluid Fertilizer Application
Improving Up-Time    Improving Accuracy

Application Equipment

High Volume Applicators / Pre-plant Applicators
Post Applicators
Pull Type Applicators with Liquid Fertilizer
Planters with Liquid Fertilizer
Planters w Liquid Fertilizer
Fluid Fertilizer Application
Improving Up-Time    Improving Accuracy

Planters w Liquid Fertilizer

Improving Up-Time

A. Pump
B. Plumbing
C. Flowmeter
D. Dry Check
Fluid Fertilizer Application

Improving Up-Time   Improving Accuracy

Planters w Liquid Fertilizer

Improving Up-Time

A. Pump
   A. Pump System for the Rate and Material
   B. Electric Pump vs Hydraulic

B. Plumbing
C. Flowmeter
D. Dry Check
Fluid Fertilizer Application

Improving Up-Time

Planters w Liquid Fertilizer

Improving Up-Time

A. Pump
B. Plumbing
   A. Sizing Hose to GPA
   B. Filtration
C. Flowmeter
D. Dry Check

Improving Accuracy
Fluid Fertilizer Application
Improving Up-Time    Improving Accuracy

Planters w Liquid Fertilizer

Improving Up-Time
A. Pump
B. Plumbing
C. Flowmeter
D. Dry Check
Fluid Fertilizer Application
Improving Up-Time   Improving Accuracy

Planters w Liquid Fertilizer

Improving Up-Time
A. Pump
B. Plumbing
C. Flowmeter
D. Dry Check
   A. Run Control System control valve
   B. Operate Boom Valves
Fluid Fertilizer Application
Improving Up-Time    Improving Accuracy

Planters w Liquid Fertilizer

Improving Accuracy
A. Control System
B. Flowmeter
C. Variable Rate
D. Nozzle Selection
E. Flow Monitor System
Fluid Fertilizer Application
Improving Up-Time  Improving Accuracy

Planters w Liquid Fertilizer

Improving Accuracy

A. Control System
   A. SCS 440-ISO and Everything In between
B. Flowmeter
C. Variable Rate
D. Nozzle Selection
E. Flow Monitor System
Fluid Fertilizer Application

Improving Up-Time    Improving Accuracy

Planters w Liquid Fertilizer

Improving Accuracy

A. Control System
B. Flowmeter
   A. Turbine
   B. Mag Meter
C. Variable Rate
D. Nozzle Selection
E. Flow Monitor System

**Turbine Flow Meters**

- Low flow – .5 – 12 gpm
- High flow – 2 – 40 gpm

**Magnetic Flow Meters**

- No moving parts
- Very accurate
- Price is about $400 more than a typical turbine flow meter
- Available in 8 different sizes depending on the GPM requirement
Fluid Fertilizer Application
Improving Up-Time  Improving Accuracy

Planters w Liquid Fertilizer

Improving Accuracy
A. Control System
B. Flowmeter
C. Variable Rate
   A. AgXcel GX30iVRT
D. Flow Monitor System
Fluid Fertilizer Application
Improving Up-Time

Improving Accuracy

Planters w Liquid Fertilizer

Improving Accuracy

A. Control System
B. Flowmeter
C. Variable Rate
D. Flow Monitor System
   A. TeeJet 6140 Flow Monitor
   B. AgXcel GX7 Row Monitor
   C. JOHN BLUE
Fluid Fertilizer Application
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Application Equipment
- High Volume Applicators / Pre-plant Applicators
- Post Applicators
- Pull Type Applicators with Liquid Fertilizer
- Planters with Liquid Fertilizer
Thank you