



CropLife Workshop on Better Application in Asia

4. Calibration: why, how and what to achieve?



v. 10 September 2017

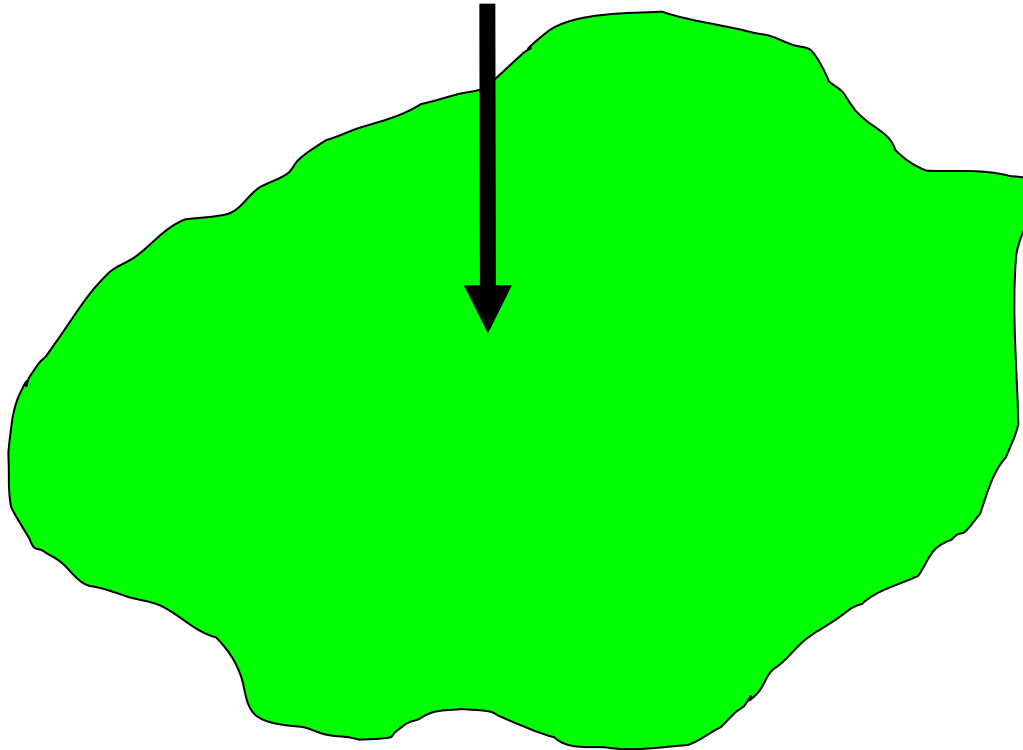


Calibration

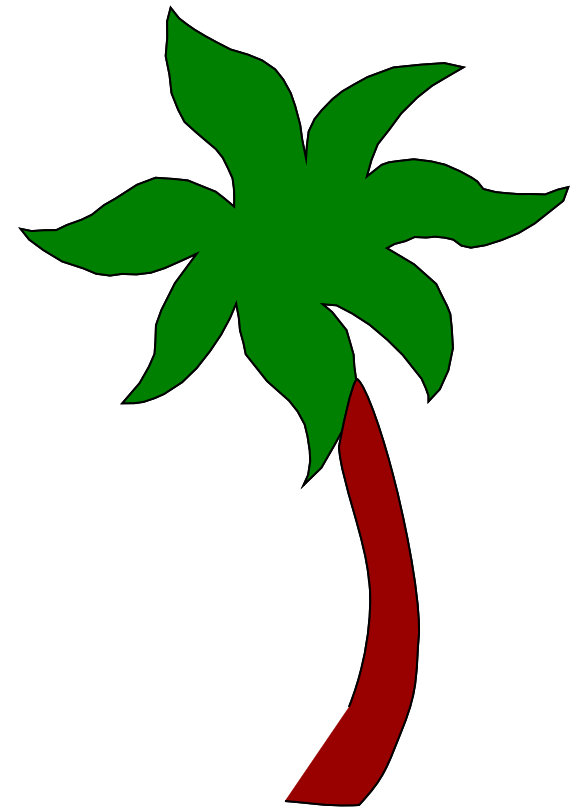
- Dosage
- Nozzles and flow rates
- What to measure => Calculations
- Volume Application Rate

Dose and dosage

- **Dose** per flat field?
Kg / L per hectare



- Dose to a tree/plant?
- Dose per leaf area?
- Dose to a specific target?



- **Dosage**: to individual plants/insects (*i.e.* variability)

Why does droplet size matter?

Actual dose on pest ...



12.4 μm



1 pL

0.000 000 000 000 1 L

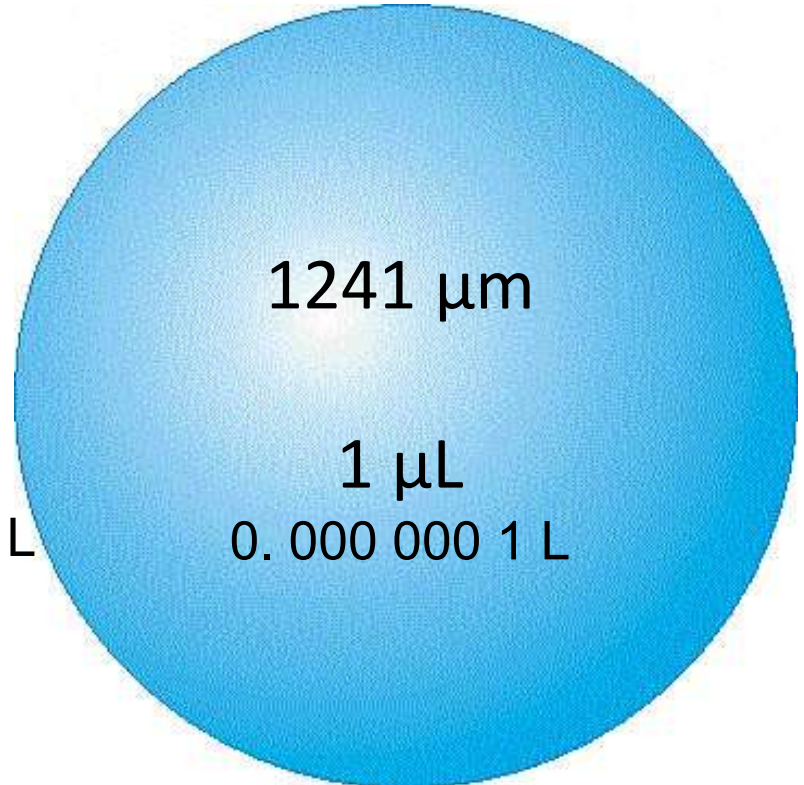
124 μm



1 nL

0.000 000 000 1 L

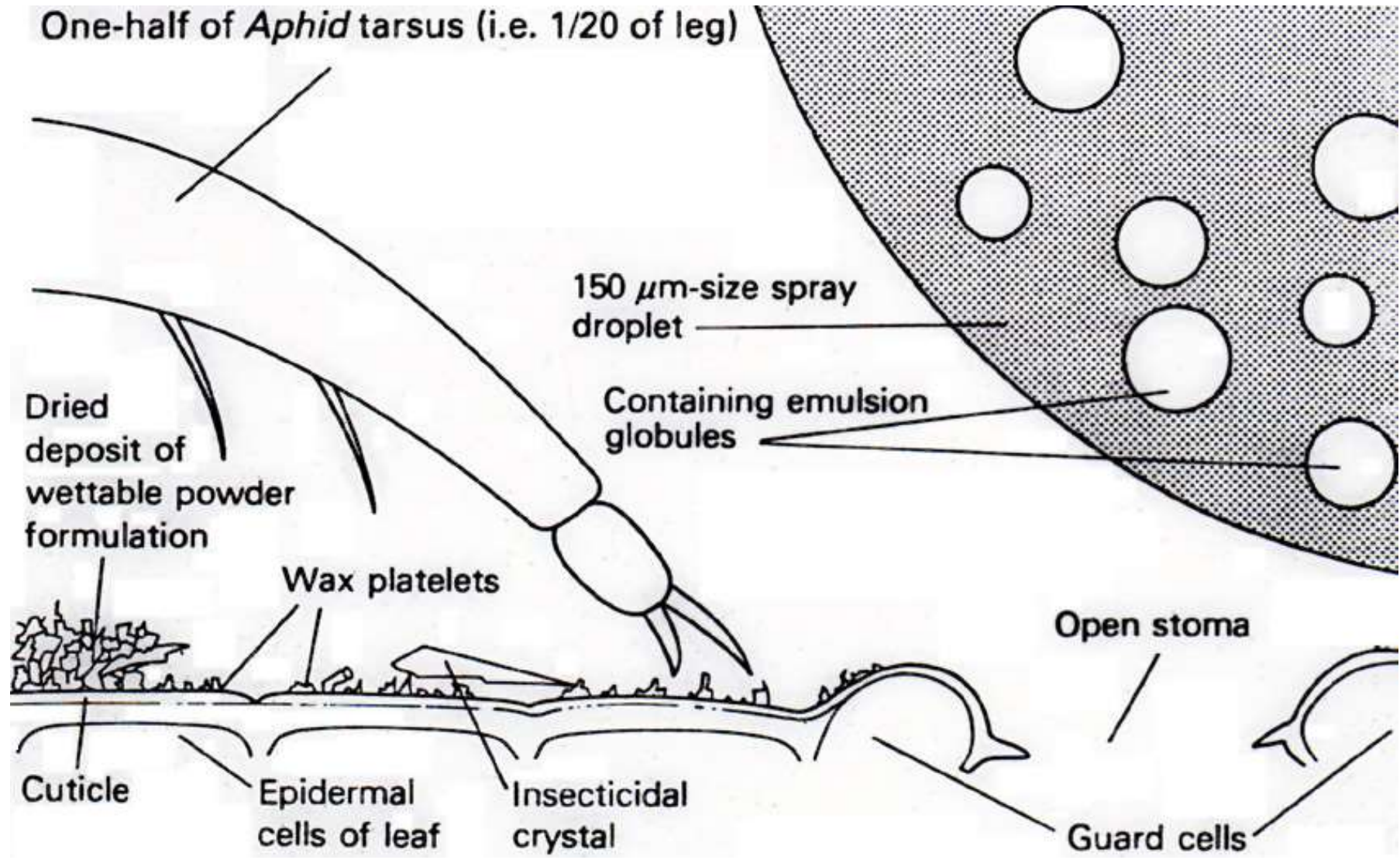
1241 μm



1 μL

0.000 000 1 L

... and what happens at the leaf surface?



Multiple nozzles: v. high flow rates

Run-off is waste!



... are multiple orifice nozzles necessary?



Can we be sure of the flow rate?



Standard calibration: what to measure?

- Flow rate
- Track spacing
- Forward speed

To increase / decrease flow:

- Change nozzle
- Change pressure (smaller differences)
- (adjust forward speed / track spacing for VAR)

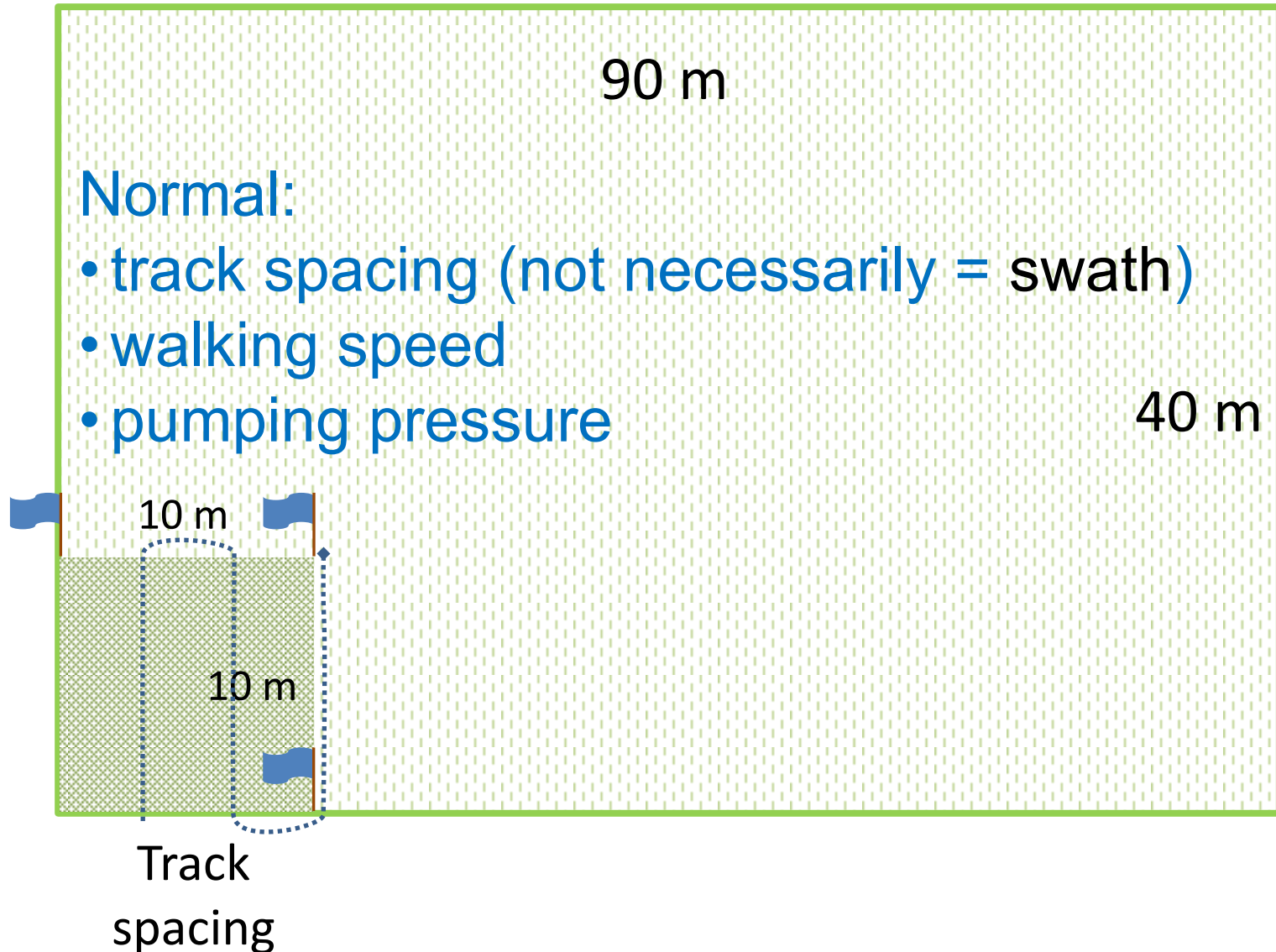
Calibration

- Standard

- 'Kalibottle', *etc.*



Calibration (1 mẫu field)



Calculations

- Establish the **volume application rate (VAR)** and all else follows on!

$$\text{VAR in litres/hectare (V)} = \frac{k \times F}{T \times S}$$

where:

F (L or ml/min.):	flow rate
T (m):	width of track spacing
S (m/min. <i>etc.</i>):	forward speed
k :	constant

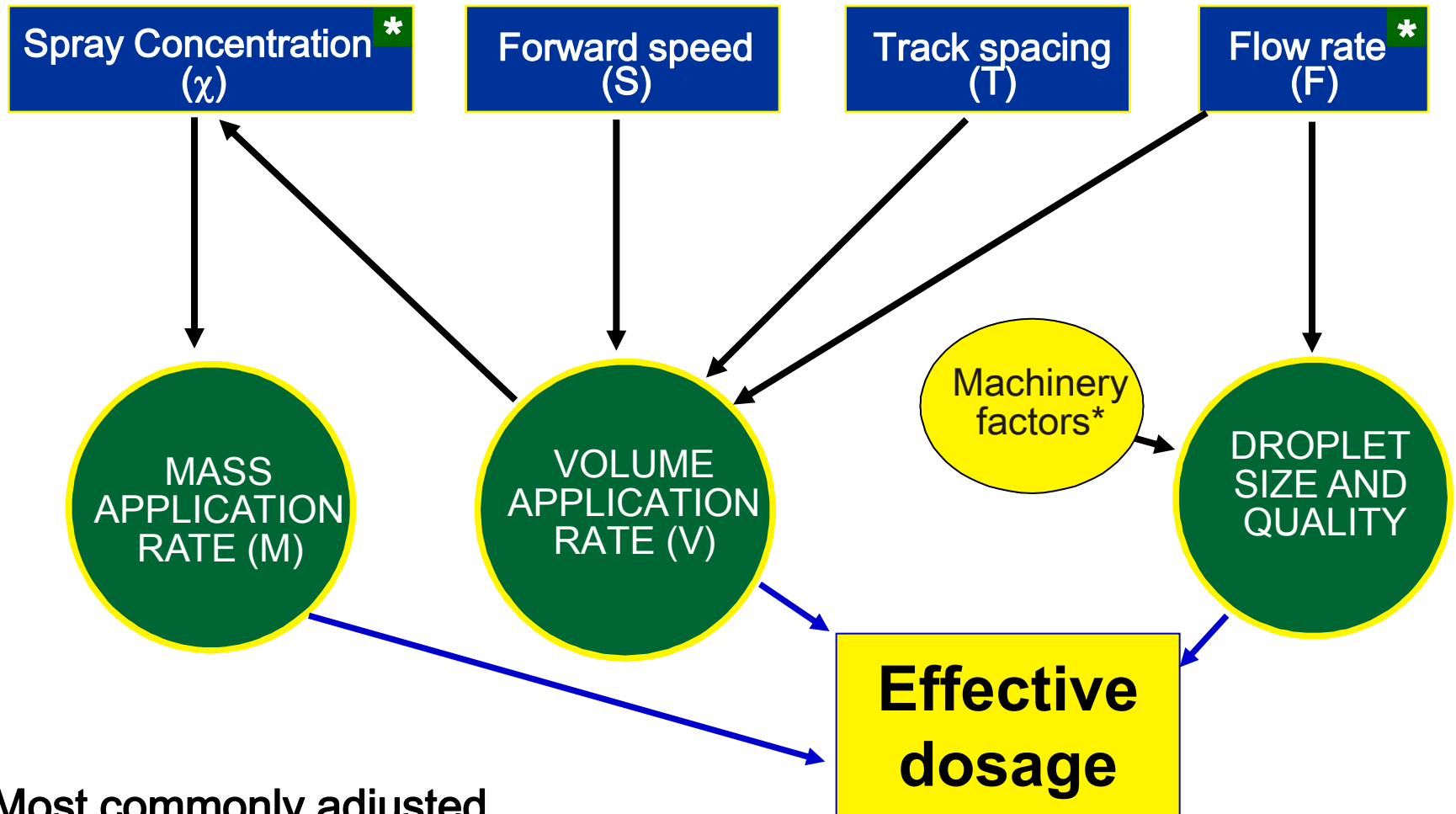
$k = 10,000$ when **S** is m/min and **F** is measured in L/min.

Flow rate

→ Volume application rate (VAR)

→ Mixing rate

Calibration and dose-transfer



* Most commonly adjusted

You can sometimes persuade farmers to change their spray nozzles!

Summary

- Work rate and Volume Application Rates matter to farmers and can save money
 - Calibration
 - Review equipment used and application techniques
- Hydraulic nozzles: established technology that can be implemented internationally.
 - Changing nozzles most readily available method, but
 - ... need an ability to exchange (standard nozzle bodies)
 - ... apply international standards.