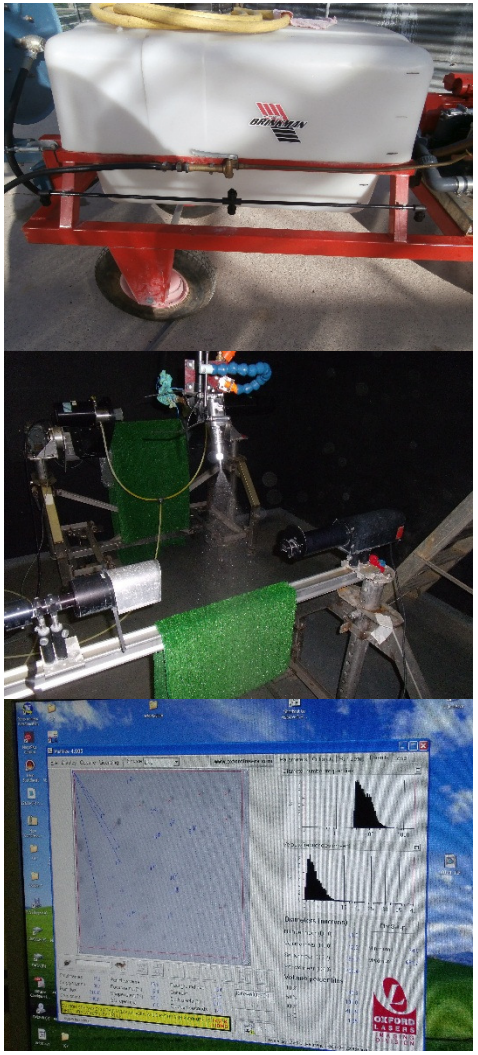


PO 008 Improving the efficiency of spray application for ornamental crops: a study of current spraying methods and novel spraying technologies

David Talbot & Bill Basford

Overview

- Project started by the late Dr John Buxton & Bill Basford
- Desk study written up & available to HDC members
- Droplet analysis at Silsoe & nursery visits complete
- HDC news article by and factsheet being written
- Final report by 30/05/14
- Further work

Results from work at Silsoe

a. Increasing pressure reduced mean droplet size

b. It was not possible to reset the RIPA pistol to give the same result

c. A smaller tip gave a smaller droplet size and lower flow rate

d. Worn 2.0 mm tip increased mean droplet size by 7.9% and mean flow rate by 9.6%

e. Increasing the pressure increased droplet velocities

f. High pressure is required with a ‘as new’ 2mm tip to achieve a fine spray when fully closed – droplet size increased as the knob is opened.

g. Comparing the as new 2mm and 1.2mm tip indicates that the effect of adjusting the knob had a greater effect on droplet size delivered by the 1.2mm tip

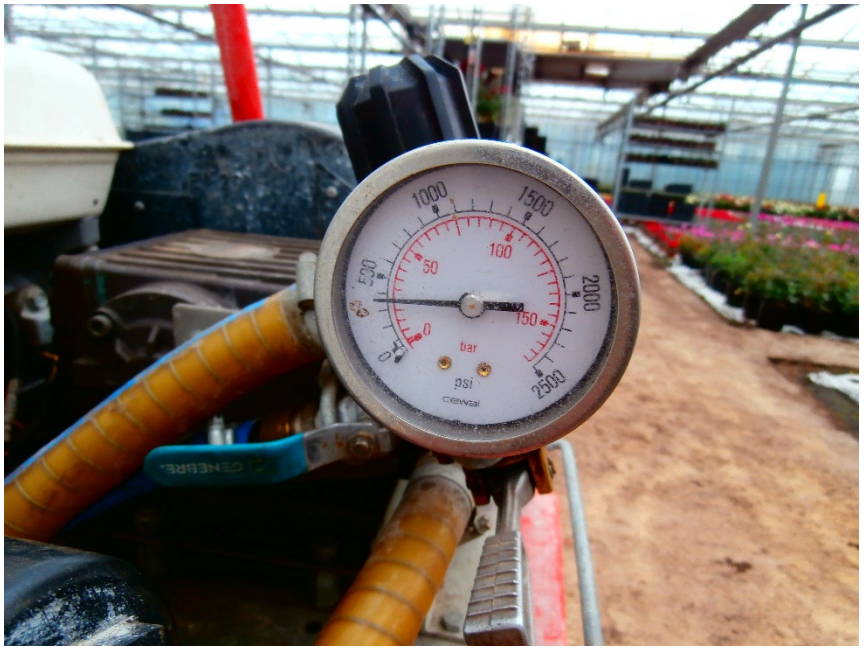
ADAS

Nursery visits

4 nurseries primarily using RIPA pistols, 1 using hand held boom with 3 flat fan 110º nozzles, 1 Empas sprayer with hollow cone nozzle.

Pressure

- High pressures 10 – 30 bar (some did not know)
- Broken pressure gauges found on almost every nursery visited
- Impacts upon flow rate (450L/Ha to 2397L/Ha, two way sprays at 4400 L/Ha!!)



Practical impacts for growers

- Replace broken pressure gauges
- Consider a pressure gauge at point of delivery (large scale) – if not possible work out delivery by calibrating pressure loss
- Check nozzle wear at least every 50 hours (visually check every 2 months), investigate less than perfect patterns – where output changes by 5% act
- Stock new, replacement nozzles

Improving application through reduced water volumes

- New 2.0mm tip will achieve fine spray quality at 8 to 10 bar when open 180º (1/2) and 270º (3/4).
- Too higher pressure = more fine droplets, increasing drift; aim for medium to fine spray droplets
- Choose appropriate spray quality for the product; spraying to run off leads to waste (pollution risk)
- Test coverage with water sensitive paper

Knapsacks

- Calibrated whilst on site
- General lack of knowledge of the importance of nozzle type
- Worn nozzles found

RIPA - summary

- Crude bit of kit
- Inevitably results in overlapping (risk of overdosing)
- The Empas sprayer may be considered as an alternative as it might be easier to modify to give a repeatable setting

Boom based systems

- Most even and uniform application.
- Automated booms are the ultimate.
- Simple hand held booms will be suffice in most crops and situations.
- Need to select the correct nozzle and pressure as this affects L/minute

Boom case study

- Best nursery using simple hand held boom.
- Has already changed to smaller nozzle (re aligned) to reduce flow rate
- Pressure reduced from 10 to 4 bar
- Grower reports good results


BRINKMAN

Boom case study results

- Has cut water volume from 2397 L/Ha to 600L/Ha
- Already delivering savings of over £1000 on one PGR alone
- Not finished yet – options to reduce pressure further and to decrease nozzle size further

Why it is important to reduce water volumes

- Legal issue if you assume that you are spraying at 1000L/Ha; you may be over dosing
- Cost – reducing volumes will save time filling sprayers and can save significant quantities of pesticides
- If spraying to run off where does the run off go???

Conclusions to date

- **Remember agriculture is using 200 – 300L/Ha for a more challenging target**
- **Lack of investment in spraying technology on most nurseries**
- **Lots of work still to be done to catch up**

Questions??

Acknowledgements

- Industry representatives: Russell Woodcock & Colin Frampton
- Participating nurseries
- Bill Basford
- HDC