



tips for travelling gun irrigators

SERIES 2: IRRIGATION SYSTEMS

- **Strong winds** affect spray patterns. This may vary application rates up to 10 times the average of the no-wind condition. Irrigate at night to maximise use of still conditions.
- Travelling guns should be set up to **travel perpendicular** rather than parallel to the **prevailing wind**. This will minimise the effect of the wind on distribution uniformity.
- Manufacturers often recommend **lane spacings in excess of technical recommendations**. Spacings of 60–65% of wetted width in still conditions and 30–50% for windy conditions will significantly improve distribution uniformity. Poor distribution uniformities occur when spray distributions do not overlap sufficiently. (It is important to remember that the **area that can be irrigated** in a set period of time for the same flow rate and operating pressure **is reduced by narrower lane spacings**.)
- **Speed variations** within runs for travelling gun irrigators can be as much as 50%. Reducing speed variation increases distribution uniformity. The main factors are uneven topography, increasing drag length for soft hose machines, and variations as the hose winds up for hard hose machines.
- **Reducing the sector angle** from 360° can improve the distribution uniformity. A reduction to 270°–330° can result in less water being applied to the travel lane which in turn reduces tracking problems. The optimum sector angle for different travelling guns will vary but significant gains can be made from this reduction in sector angle.
- **Matching application rate with the infiltration rate** of the soil is a simple but very important factor when operating a travelling gun. Application rates that are too high will cause irrigation water to run-off and/or pond on the soil surface.
- Considerable **savings on pumping costs** can be made by ensuring the overall pressure is minimised e.g. aiming for minimum friction losses, correct pipe sizes, and selecting a nozzle with minimum pressure to do the job.
- Poor distribution uniformity will result if the **pressure of the system is too low**. It is too common to find travelling guns operating below the recommended pressure.
- The **pump should be matched** to the overall travelling gun system. Pumps should be selected to match the system requirements at the highest efficiency. Poor pump efficiency costs money.
- **Selecting the correct nozzle** is important for travelling guns. Taper nozzles produce greater wetted diameters and are better in windy conditions, whereas ring nozzles break up the spray trajectory causing smaller droplet sizes and reduced wetted diameters.

- **Trajectory angle of 24°** is a good compromise between throw distance and wind effects. Angles greater than this will reduce throw distance and are subject to higher wind drift.
- **For travelling booms, sprinkler selection** is also important. Uniformity depends on several factors such as wetted diameter, height above crop or ground, and sprinkler spacing. Even within recommendations from sprinkler manufacturers, uniformity can vary from 60% to 95%. Sprinklers with small wetted diameters are more likely to have problems with high instantaneous application rates, resulting in ponding and runoff. Altering the boom height changes the wetted diameter.

Summarised from *Travelling gun and boom irrigation machines*

G Newell, J Foley & R Smith, January, 2002,
National Centre for Engineering in Agriculture, Toowoomba, Qld.

Series 1
Irrigation farm resources

Series 2
Irrigation systems

Series 3
Irrigation management

Authors
Mitchell Carter & Peter Smith,
Irrigation Officers, Tamworth

For more information contact
WaterWise on the Farm

Phone
1800 255 444

Email
waterwise@agric.nsw.gov.au

Website
www.dpi.nsw.gov.au/waterwise



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

023

© 2005 NSW Department of Primary Industries

This publication is copyright. Except as permitted under the Copyright Act 1968, no part of the publication may be produced by any process, electronic or otherwise, without the specific written permission of the copyright owner. Neither may information be stored electronically in any form whatever without such permission

Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing (August 2003). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of NSW Department of Primary Industries or the user's independent adviser.

The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product does not imply endorsement by NSW Department of Primary Industries over any other equivalent product from another manufacturer.