

ICL Technical Fact Sheet

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Topic: Hydraflo

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The development of water repellency

Healthy media contains a huge diversity of microorganisms that use the carbon stored in pinebark, peat and coir as an energy source. The by-products of microbial activity include plant waxes, resins and inert lignins. These left-over waxes and resins remain on the media surface, contributing to water repellency. The development of water repellency is completely normal in media and can be regarded as one sign of robust microbial activity.

Water repellency develops over time and is normally more severe in older stock. Some

signs of water repellent media can include:

- Visual dry spots in media
- Slowing water infiltration rate
- channeling of water down the insides of container
- plants under stress between irrigations.

Plants may also suffer from the effects of relatively mild water repellency even before the media shows visual signs of dry patch. In the early stages of development, moisture storage in the growing media will be affected.



Figure 1. Severe water repellency can result in dry patches and water channelling through the media.

How surfactants improve water distribution in media

In water repellent media, the surface tension of the water prevents droplets from spreading over a large surface area of the media (Figure 2). The rate of water absorption will slow and primarily channel downwards through the pot due to gravitational forces.

Hydraflo is highly efficient at reducing surface tension. It will help to spread the water and cause it to penetrate dry media more efficiently. Due to the improved spread and contact angle with droplets, the water will move laterally and be absorbed uniformly throughout the pot (Figure 2).

Media treated with Hydraflo absorbs irrigation water faster and stores significantly more moisture than untreated media (Table 1, Figure 3).

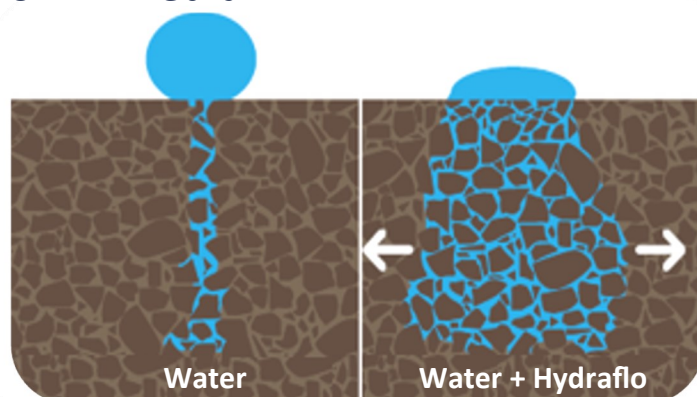


Figure 2. Hydraflo reduces surface tension and increases water absorption by media.

Table 1. Hydraflo improved water retention for ten months at the recommended drenching rate.

Wetting Agent	Rate (mL/10L water)	Water Retention (%) at month		
		0	4	10
Control	-	71.9 b	68.5 c	48.4 c
Hydraflo L	20	93.2 a	93.5 a	91.4 a

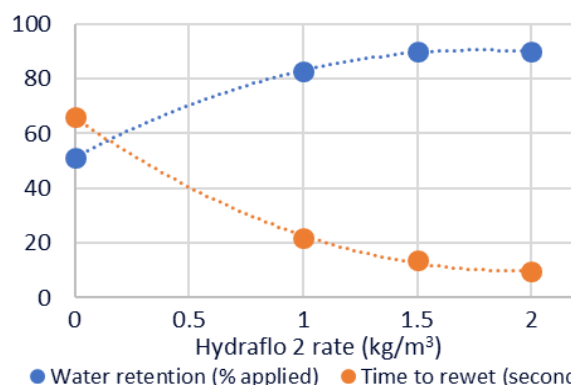


Figure 3. Hydraflo 2 substantially increased water storage in media and reduced infiltration time.

Nursery trial results

Gardenia Florida were topdressed with granular Hydraflo 2 at 0 grams, 1 gram and 2 grams per litre. At 50 days after treatment, plants treated with Hydraflo had larger leaves and improved leaf colour (Figure 4). At 2 g/L, 100% of the treated plants were saleable. At 1 g/L 65% of the treated plants were saleable. When left untreated, only 53% of the plants were saleable.



Figure 4. Reapplication of Hydraflo to Gardenia Florida improved leaf size, leaf colour and reduced the time to sale.



Following irrigation, impatiens were allowed to dry down for a two-day period to simulate conditions that the plants might be subject to after leaving the nursery. Plants treated with Hydraflo were more resilient and less affected by moisture stress than

The re-application of Hydraflo to established plants doubled the number of saleable Gardenia within 50 days after application.

The application of a wetting agent can also assist plant performance in retail settings, interior plantscapes and in the home. Hydraflo was applied to half a batch of impatiens. The remaining plants did not receive a wetting agent.

untreated plants. This effect was most likely due to the improved water holding capacity of media that had been treated with Hydraflo, the ability to rewet easily and the improvement in irrigation efficiency that results.

Application methods and rates

Hydraflo is available in both granular and liquid formulations. Granular Hydraflo 2 can be incorporated into media prior to potting and re-applied to older stock using either a hand-shaker or mechanical spreader. Spreaders such as ICL's Handy Green or a Solo spreader are more efficient than a hand-shaker for treating larger beds of plants (assuming that excess foliage will not prevent Hydraflo granules from landing on the media surface).

Liquid Hydraflo L can be sprayed onto the media surface, applied as a drench or injected through drip irrigation lines.

Recommended application rates are given in the following tables. Where expressed as a range, the optimum rate will depend on the performance required. Higher rates are recommended for severely water repellent media or where longer-term performance is required (up to 10 months between applications). The performance of a wetting agent will degrade over time. Therefore, a higher application rate will help extend the time between applications.

Application rates of Hydraflo 2

Growing system	Incorporated in media (rate per m ³)	Mid-season (rate per pot L)
Nursery and Greenhouse potting mixes	1 – 2 kg	1 – 2 g/L
Propagation & Plug potting mixes	0.3 kg	
Dispatch to consumer (topdress)		1 g/L
Interior plants (topdress every 6-10 months)		1 -2 g/L

Application rates of Hydraflo L

Growing system	Incorporated in media (rate per m ³)	Mid-season (rate per 1000 L water)
Nursery and Greenhouse potting mixes	150 ml (in suff. water to incorporate)	2000 ml, 6-10 months after potting
Propagation & Plug potting mixes	75ml (in suff. water to incorporate)	
With irrigation (daily feeding)		5 ml
Dispatch to consumer (drench)		500 – 1000 ml
Misting cuttings (drench)		150 ml
Interior plants (drench)		500 – 1000 ml