

ICL Technical Fact Sheet

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Topic: Weed Management

By
Dr. Samuel Stacey



Nursery Weed Management

Successful weeds can reproduce easily within the management systems that we have in place. Some of the most successful nursery weeds have short generation times, being able to

Figure 1. Two significant weeds in nurseries.



Spotted Spurge
Chamaesyce maculata



Flickweed *Cardamine* sp.

germinate, grow, flower and set seed within a typical spraying or hand-weeding rotation. Successful weeds often have large seed numbers and minimal dormancy periods. This helps them to spread, germinate and reproduce within short periods of time.

Two of the most successful weeds that currently affect nurseries are flickweed (*Cardamine* sp.) and spotted spurge (*Chamaesyce maculata*) (Figure 1). Under ideal conditions both can reproduce within five weeks and produce large numbers of viable seeds. For this reason, weed management should focus on sanitation (especially removing weeds before they flower and preventing seed spread), minimising germination and growth and efficient hand removal.

Sanitation and Hygiene

- Remove weeds before they set seed. Mature weeds are a source of seed that will spread throughout the nursery. We suggest:
 - Knock-down herbicides or steam wand on paths, surrounds, around structures and on gravel between crops.
 - Hand weeding every two weeks within crops (recommended method is below).
 - Use of a long-term pre-emergent herbicide such as Sierraron 4G in paths and gravel beds.
- Sweep and clean weed mat to remove loose potting mix and soil between crops.
- Ensure propagation material is weed free. Weed seeds stuck to tubestock and liners will germinate and spread those weeds throughout the nursery.
- Use new or washed and sterilised pots. Weed seeds can stick to re-used pots.

- Bag mature weeds that have been removed by hand. They can contain seed pods that may remain viable and be a source of contamination.



Figure 2. Tubestock should be weed free to prevent the spread of seeds throughout the nursery.

Minimising Germination and Growth

Weed growth increases when they can readily access nutrients. Research has shown that the growth of common nursery weeds can be reduced by more than 85% through fertiliser placement effects:

- Avoid the application of fertilisers at the surface of pots. Choose the correct longevity of controlled release fertiliser at potting so that topdressing can be avoided.



Figure 3. Applying fertiliser on the surface of pots can increase weed growth (right) compared to subsurface application (left).

- Sub-surface dibble application can place fertiliser deep enough to significantly reduce weed growth (Figure 3).
- When controlled release fertiliser has been incorporated in media, mulches can be applied to the surface of pots so that germinating weeds do not have ready access to nutrients. Mulch needs to be thick enough that roots cannot quickly penetrate the mulch layer (Figure 4).



Figure 4. Mulches with low nutrient levels may also provide a weed-resistant surface.

Pre-emergent herbicides are an invaluable tool to help minimise weed germination and establishment. To be effective, applications need to be done in a timely fashion (within 24 hours of potting up or hand weeding). Applications should be at the correct label rate and with an even distribution across the surface of pots or area applied (Figure 5).

We recommend that growers:

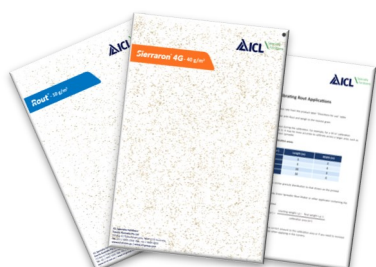
- Ensure the target weed species are listed on the product label.
- Apply pre-emergent herbicide after potting up and watering in, once the foliage is dry. Then lightly water in the herbicide.
- Reapply pre-emergent herbicide at the correct interval (see label) after hand weeding and then lightly water in.
- Read the product label, especially the Directions For Use table, to obtain the correct application rate, the frequency of application and any precautions.
- Be aware of breaking the chemical barrier when hand-weeding or when pots blow over which may mean re-application is needed.
- Read the safety data sheet (SDS) regarding personal protective equipment (PPE), potential hazards, first aid measures and clean up guidelines in case of a product spill.
- Remember that environmental conditions such as increased levels of sunlight, warm temperatures and increased moisture can cause pre-emergent herbicides to biodegrade faster.



Figure 5. Pre-emergent herbicides need to be applied evenly across the surfaces of pots and at the correct application rate.

Resources available from ICL include:

- Rout and Sierraron 4G calibration guides.
- Rout shakers and rotary spreaders for application.
- Rout labels that tag-lock to pots to keep track of application dates in the field.
- Professional advice.



Efficient Hand Weeding

Regular hand weeding is an essential weed management practice that should be used alongside other methods of control. Efficient hand weeding can have a dramatic effect on the level of weed pressure in a nursery.

Research by Barker and Neal (2016) showed that hand weeding required less labour and had a greater effect on overall weed control when carried out every two weeks rather than every eight weeks.

| Weeding interval | Labour (hours/1000 ft ² /week) | Cost (\$/1000 pots/week) |
|------------------|---|--------------------------|
| 2 weeks | 0.29 | \$2.09 |
| 8 weeks | 0.55 | \$3.85 |

Table 1. Average labour costs when hand weeding on two and eight-week schedules. Calculated from Barker and Neal (2016).

When hand weeding every two weeks:

- Larger, established weeds should be removed as they could potentially flower prior to the next hand weeding cycle.
- Small weeds less than 1 week old can remain. They will be removed during the next hand weeding cycle and prior to flowering.
- Barker and Neal (2016) showed that labour costs could be almost halved using a two-week hand weeding schedule

because small weeds are often the most time consuming to remove. They also found that the two-week schedule reduced overall weed growth by approximately 70%, averaged across six sites.

Additional Reading

- Stacey S (2018) War of the Weeds, ICL Specialty Fertilizers.
- Barker A and Neal JC (2016) Frequent hand weeding saves money, North Carolina State University. <https://content.ces.ncsu.edu/frequent-hand-weeding-saves-money>.
- Atland J, Cultural and Sanitation Practices. Oregon State University. https://oregonstate.edu/dept/nursery-weeds/feature_articles/sanitation/sanitation_page.html
- Atland J, Herbicide Timing for Container Weed Control. Oregon State University. https://oregonstate.edu/dept/nursery-weeds/feature_articles/timing/herbicide_timing.html
- Atland J (2019) Top 10 reasons herbicides fail. *Nursery Management*, January 2019. <https://www.nurserymag.com/article/top-10-reasons-herbicides-fail>
- Neal JC and Gordon I (2003) Common weeds of container Nurseries and their control, The University of Queensland.

Download a copy of Weed Management Schedule, available as an appendix to this document from ICL (Click here [Appendix](#)).

Scheduling Weed Management

We strongly suggest weed management is scheduled rather than being left to chance. An example schedule that could be adapted for use is given below:

| Weed management schedule | | | | |
|--|--------------|-------------------------------|---------------------------------------|---------------------|
| Date: | January 2020 | | | |
| Location: | Zone 1 | | | |
| All blocks to be swept and have knockdown herbicide applied between crops. | | | | |
| Week No. | Growing beds | | Paths & Surrounds | |
| | Hand weeding | Pre-emergent herbicide (Rout) | Pre-emergent herbicide (Sierraron 4G) | Knockdown Herbicide |
| 1 | | | | |
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