

Herbicide resistance and how to avoid it

Avoid creating “superweeds”

WEEDS MAY DEVELOP RESISTANCE TO HERBICIDES AFTER REPEATED APPLICATIONS OF A SINGLE HERBICIDE, OR HERBICIDES WITH THE SAME MODE OF ACTION. INDIVIDUAL PLANTS MAY EVENTUALLY DOMINATE THE WEED POPULATION IF SIMILAR HERBICIDES ARE USED REPEATEDLY AND EXCLUSIVELY IN CONTROL PROGRAMMES.

The risk of creating ‘superweeds’ might also be increased when low dosages are applied. Under-dosing (to save costs) does not provide adequate control and the surviving weeds might become resistant to the herbicide. True herbicide resistance is inherited, and much higher dosages might be required to control succeeding populations.

Current SASRI research projects include exploring different modes of action and investigating integrated control measures.

How to prevent or delay herbicide resistance:

The following guidelines should help to prevent, or at least delay, herbicide resistance:

1. Keep accurate spraying records for each field, giving reasons for poor efficacy.

2. Apply herbicides according to label recommendations (correct rates and stages of weed growth). Do not reduce recommended rates or experiment with ‘cocktails’. In addition, ensure that equipment is properly calibrated and suited to the walking speed of the spray operator(s). A walking speed that is too fast will result in under-dosing, leading to inadequate control thus increasing the risk of herbicide resistance of weeds.

3. Rotate herbicides or use tank mixtures with products having different modes of action.

4. Prevent seed of resistant plants returning to the soil seed-bank by applying herbicides to small weeds before they produce seed.

5. Integrate other control methods into weed control programmes. Examples include biological control agents, a trash blanket and green manures that shade out many weed species, hand-weeding and habitat management. Refer to the SASRI Herbicide Guide 2011: pages 58 – 60.

Avoid creating "super-Cynodon"


As an example of how the guidelines discussed are used in practice, here are the Best Management Practices for avoiding herbicide resistance when dealing with *Cynodon dactylon*.

- **Rotation of herbicides in-field:**

A long fallow with minimum tillage, using glyphosate (HRAC group G), with repeated spotsprays is required prior to replanting the field. To break a potential continual use of glyphosate, use paraquat + diuron (HRAC groups D and C2) in short cane to knock back the grass, thereby allowing the cane to pull away to form a canopy and hence shading out the Cynodon. Follow this by applying an under-canopy spray of glyphosate (only used in tall cane with dead leaves on lower portions of stems). Where the Cynodon has broken rhi-

zomes, an alternative option is the application of fluazifop-butyl (HRAC group A) in fallow fields.

- **Rotation of herbicides along verges and in breaks:**

Apply mechanical mowing or alternatively, chemical mowing with paraquat + diuron (HRAC groups D and C2) alongside short cane. Where there is Cynodon alongside mature cane, apply glyphosate (HRAC group G), imazapyr (HRAC B) or Fusilade Forte (HRAC group A). Direct the spray and avoid drift onto the crop. Keep records of products used in verge control, and ROTATE herbicides to avoid and reduce the risk of resistance to any one mode of action. 

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