LIBERTY LINK®

Herbicide Resistance Management Plan

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LIBERTY LINK®

The purpose of this Resistance Management Plan is, in conjunction with the Liberty® ULTRA Herbicide product label, to provide information to farmers, applicators and industry stakeholders for the successful and sustainable use of Liberty ULTRA Herbicide.

Liberty ULTRA is a non-selective knockdown herbicide registered to control a large range of grass and broadleaf weeds. Liberty ULTRA contains the active ingredient Glufosinate-P-Ammonium which has a reputation for versatility, effectiveness and a high level of crop safety in LibertyLink crops.

Liberty ULTRA is a Group 10 (previously Group N) herbicide that kills weeds by disrupting the production of glutamine synthetase. Its Group 10 mode of action can help ease pressure on other active ingredients, such as glyphosate and clethodim, and is compatible with other post-emergence herbicides.

Getting the best out of Liberty ULTRA Herbicide

Rates

Choose the Liberty ULTRA Herbicide rate that suits your weed spectrum, size and density. Liberty ULTRA rates range from **0.8 to 1.6 L/ha**. Check the Liberty ULTRA label for the recommended rate for specific weed species.

Ensure the second (follow-up) application of Liberty ULTRA Herbicide is applied. The Liberty ULTRA Herbicide label requires a split application – initial application followed by a second application 7–14 days after the first. A shorter interval between applications may result in better weed control.

Weed stage

Liberty ULTRA Herbicide is most effective when applied to small and actively growing weeds. Weed size and stage recommendations vary by species. Please refer to the label for more detailed information.

Crop stage

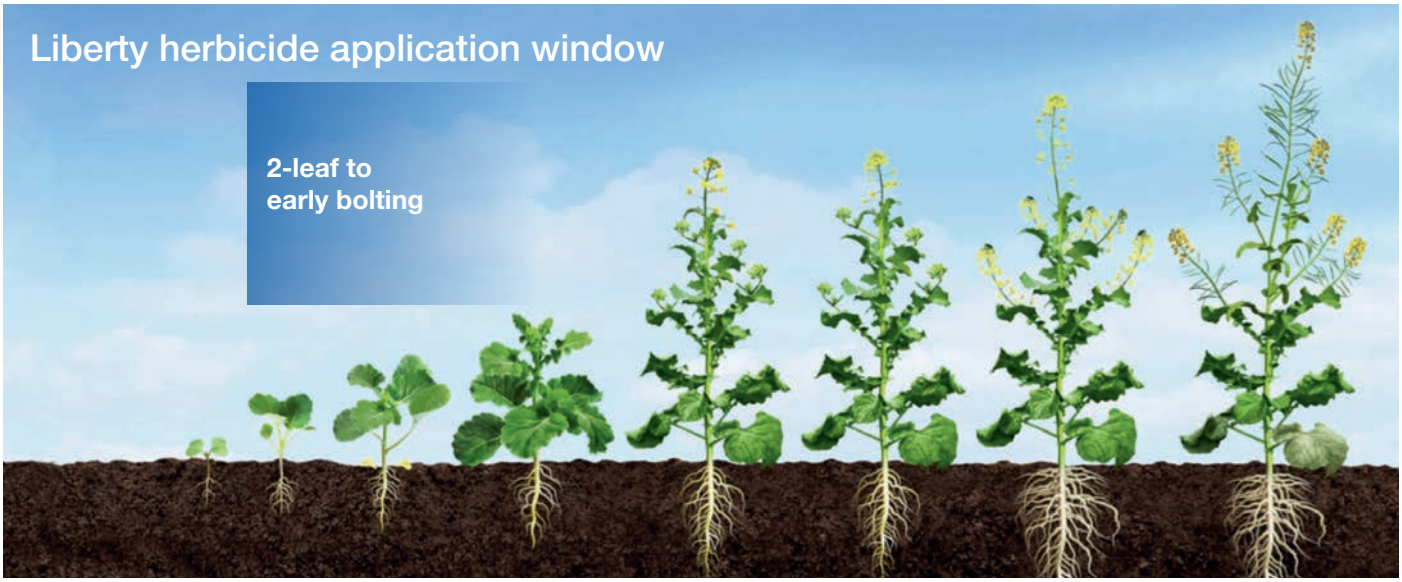
Liberty ULTRA Herbicide should only be applied over the top of the LibertyLink canola crop from its 2-leaf to the early bolting stage.

DO NOT apply Liberty ULTRA after the early bolting stage (BBCH33).

At the time of Liberty ULTRA Herbicide application, LibertyLink canola plants should be dry and not frost or moisture stressed.

Sowing time

It is suggested to sow your InVigor® hybrids early in the sowing window to ensure good early canola growth, provide crop competition and increase the likelihood of sunny days and spray temperatures above 10°C. Under cold conditions symptoms may take more than a week to appear, complete plant death may take up to 6 weeks and results may be variable.



Tank-mixing

Before and after using Liberty ULTRA Herbicide always complete a thorough cleaning of the spray tank, lines, and filter.

Add other products to the tank in the order listed on the Liberty ULTRA label. Liberty ULTRA can always be the last herbicide added to complete any tank-mix combination.

Water volume

Liberty ULTRA is a contact herbicide with very limited systemic activity, so good coverage of target weeds is essential.

Use sufficient water to ensure thorough and even spray coverage of the entire target weed – a minimum of **80 L water/ha**. In situations of high weed density or advanced weed development increased water volumes of at least 100 L/ha are recommended.

Ensure that droplet size, water volume and nozzle direction are sufficient to maximise coverage.

Coverage

Use high water volumes (>100 L/ha) to achieve good, consistent coverage on target weeds.

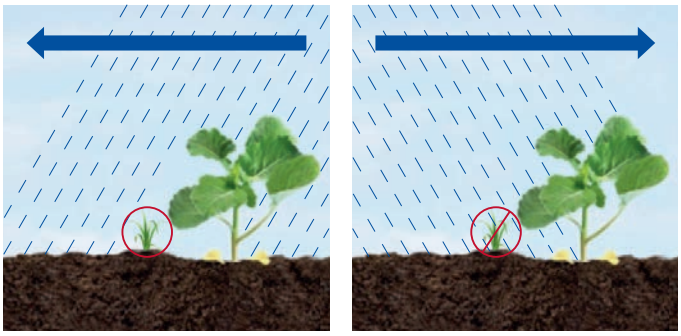
Spray direction

In order to increase spray penetration and coverage and reduce the impact of crop shading, it is recommended that the second Liberty ULTRA Herbicide application should be made from the opposite direction to the first, as shown below.

Also consider the use of twin-jet nozzles for improved spray coverage.

First spray direction

Second spray direction



Rain and dew – do not spray wet leaves

The high surfactant loading and high solubility of Liberty ULTRA Herbicide mean the product can run off wet surfaces easily.

Don't spray if leaves are moist from dew or rainfall. Don't spray if rain is forecast within 6 hours.

Weather conditions

Best results are obtained when Liberty ULTRA Herbicide is applied:

- in temperatures above 10°C
- in full daylight, at least 2 hours before sunset
- in calm, sunny conditions.

What to expect after Liberty ULTRA herbicide is applied

Canola crops can show a transient bronzing effect on the leaves of the crop, this is quite common when higher rates of Liberty ULTRA herbicide are applied.The effect is transient and the crop grows through this without impacting it's performance.

Soil and plant residues

There is a minimum recropping interval of 14 days for cereals, pulses and oilseeds following a Liberty ULTRA Herbicide application.

If Liberty ULTRA-sprayed InVigor LT or LR canola is grazed or cut for hay, the following restrictions apply:

CANOLA: DO NOT GRAZE OR CUT FOR STOCK FOOD FOR 6 WEEKS AFTER APPLICATION.

CANOLA GROWN FOR SEED PRODUCTION: DO NOT GRAZE OR CUT FOR STOCK FEED

Integrated weed management

Weed control in canola production systems involves a range of management tools. These include out-of-season control options like rotation, cultivation and using non-selective herbicides as well as pre-plant and in-crop selective herbicides.

Using a range of such options rather than relying on any one weed control option is the basis of an Integrated Weed Management (IWM) system.

Following these WeedSmart principles is recommended:

1	Regularly rotate your crops and pastures
2	Use the double-knock strategy to preserve glyphosate use
3	Mix and rotate herbicides from different chemical groups
4	Minimise the number of weed 'escapes' and prevent viable seed-set of survivors
5	Use crop competition to outcompete weeds
6	Physically destroy weed seeds in harvest trash

Use as many different weed control options (chemical and non-chemical) as necessary in both the crop and fallow phases.

See WeedSmart (https://www.weedsmart.org.au/) for further IWM information.

Herbicide resistance

Herbicide resistance has been detected in numerous weed species in Australian cropping systems, such as annual ryegrass – with resistance discovered to mode-of-action groups 1, 2, 3, 5, 8, 9, 11, 13, 15, 22 and 23 (formerly A, B, C, D, E, F, J, K, L, M and Q) – and wild radish – with resistance discovered to groups 2, 4, 5, 9 and 12 (B, C, F, I and M).

Currently there is no recorded resistance to Liberty ULTRA Group 10 mode of action in broadacre cropping in Australia, so growing LibertyLink canola can help
to increase the flexibility of your integrated weed management program and its effectiveness in slowing the progression of resistance.

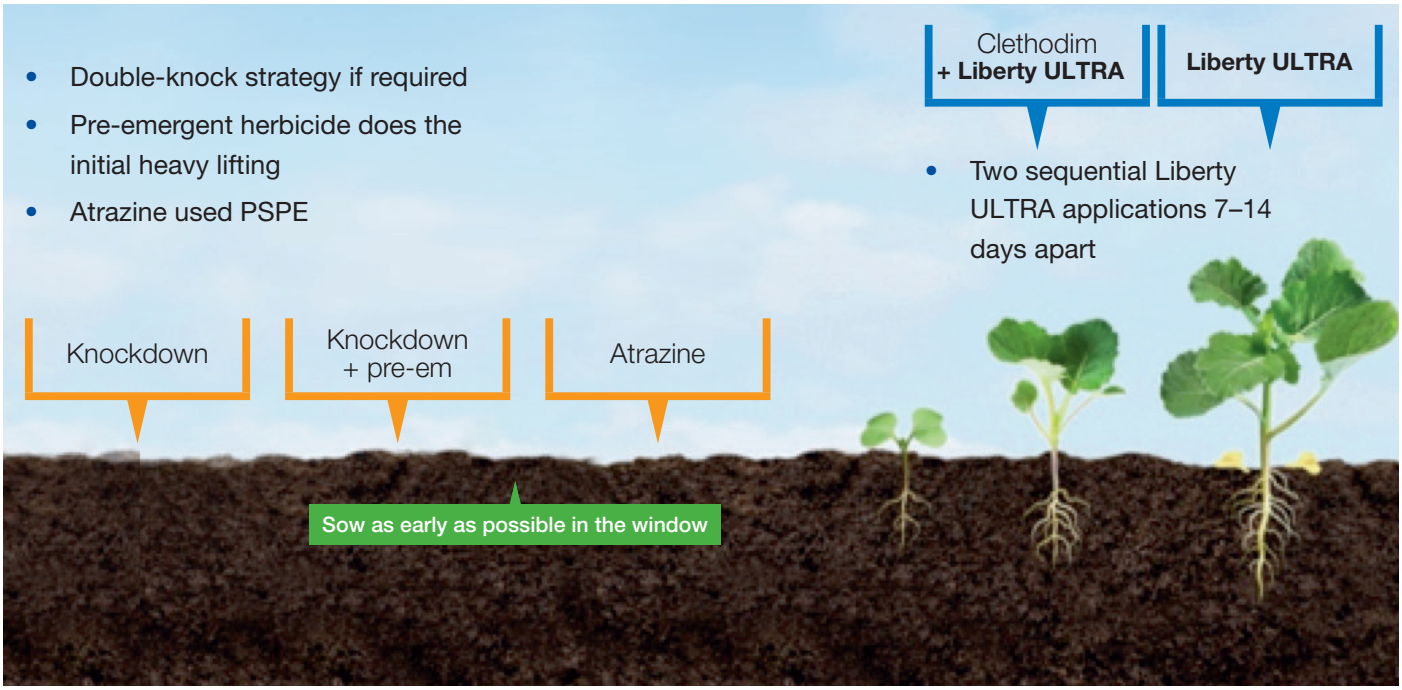
Using Liberty ULTRA to manage resistant annual ryegrass

Annual ryegrass populations with resistance to glyphosate and/or clethodim are becoming more widespread. Adding Liberty ULTRA to your canola weed control system in use patterns like the ones shown on the next page can help preserve the usefulness of that older chemistry.

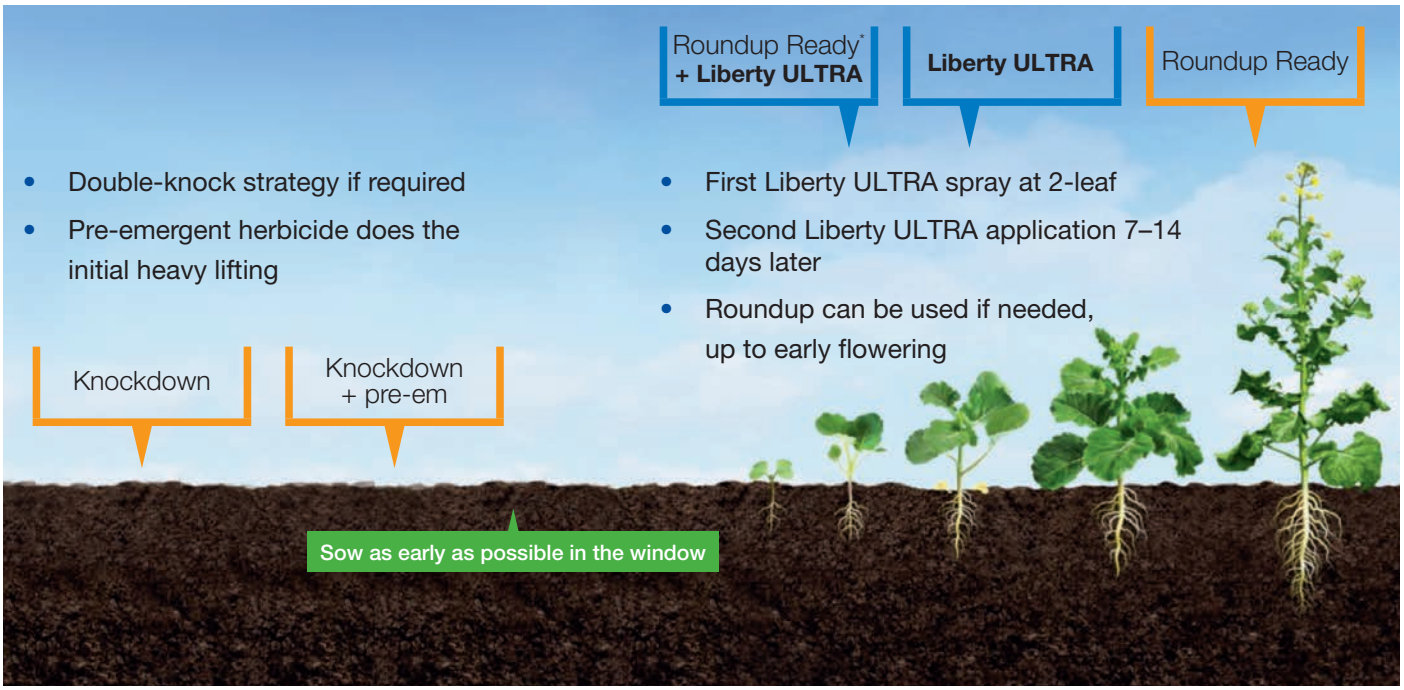
It is always good practice, particularly in the case of heavy weed burdens or resistant weed populations, to ensure a good knockdown of weeds present prior to planting. Incorporation of pre-emergent herbicides can then be followed by the use of registered partner post-emergent herbicides in crop.

Suggested spray programs

On Liberty ULTRA triazine (LT) tolerant canola



On Liberty TruFlex (LR) tolerant canola



Reporting resistant weeds

Some naturally occurring weed biotypes resistant to Liberty ULTRA and other Group 10/N herbicides may exist through normal genetic variability in any weed population. The resistant individuals can eventually dominate the weed population if these herbicides are used repeatedly. These resistant weeds will not be controlled by Liberty ULTRA or other Group 10 herbicides.

Any case of suspected weed resistance (surviving weeds that are normally susceptible to Liberty ULTRA) should be reported immediately for further investigation. Leaf or seed samples of suspected resistant weeds can be submitted to testing services available in Australia.

FAQs

Q: What is the minimum water rate recommended to help ensure effective Liberty ULTRA Herbicide application?

A: 100 L/ha. In some situations (e.g. high weed density) increased water volumes are recommended since good coverage of target weeds with Liberty ULTRA is essential.

Q: What do growers need to complete before applying Liberty ULTRA Herbicide?

A: LibertyLink stewardship training and reading the Liberty ULTRA Herbicide label.

Q: Can growers use generic glufosinate-ammonium products on LibertyLink canola?

A: Only Glufosinate-P-Ammonium registered in canola can be used. BASF's warranty only covers use of Liberty ULTRA Herbicide. BASF will not accept liability for any crop effects and impacts, herbicide damage or failures that may arise in the event that a glufosinate-ammonium herbicide other than Liberty ULTRA is used on a LibertyLink canola crop.

Q: What should growers do if they suspect they have a Liberty ULTRA Herbicide resistance issue?

A: Monitor your crop for weeds surviving herbicide applications and if resistance is suspected conduct a herbicide resistance test and implement appropriate management methods.

Q: What if I can't get the second Liberty ULTRA application on within 14 days of first application?

A: Apply the second Liberty ULTRA application at the appropriate label rate with the best possible spray coverage at the earliest possible opportunity. Ensure Liberty ULTRA Herbicide is sprayed prior to the early bolting stage, and observing the new withholding period for grazing stock. Do not graze or cut Liberty ULTRA sprayed canola for livestock producing milk for human consumption.

Q: Can I spray Liberty ULTRA during frosty conditions?

A: No, like many herbicides Liberty ULTRA will be less effective when weeds are affected by frost.

Q: Can I use triazine herbicides on InVigor LR canola?

A: No. InVigor LR canola varieties are tolerant to Liberty ULTRA and Roundup Ready with PLANTSHIELD® (or other registered glyphosate formulations), and is not tolerant to triazine herbicides. You will severely damage or kill InVigor LR canola if you use triazine herbicides in the crop.

Q: Can I use glyphosate on InVigor LT canola?

A: No. InVigor LT canola is tolerant to Liberty ULTRA and registered triazine herbicides, and is not tolerant to glyphosate herbicides. You will severely damage or kill InVigor LT canola if you use glyphosate in the crop.

Scan here for more information on Liberty ULTRA, visit **crop-solutions.basf.com.au** or contact your local BASF representative on **1800 558 399**

WEED smart
every weed every seed
every farm every year

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