



STEWARDSHIP GUIDELINES (August 2022)

INTRODUCING THE COAXIUM BARLEY PRODUCTION SYSTEM

The CoAXium Barley Production System provides Australian grain producers with a new tool to control difficult grass weeds, such as brome grass, barley grass, wild oats and susceptible annual ryegrass, in barley.

It comprises the use of Aggressor, a selective post-emergent herbicide that is registered for the control of certain grass weeds in CoAXium barley varieties. CoAXium barley varieties from AGT have been bred in Australia specifically to be tolerant to Aggressor herbicide.

Aggressor is registered for the control of certain weeds, including susceptible annual ryegrass, barley grass, brome grass, wild oats and volunteer cereals, in CoAXium barley varieties. It contains the active ingredient, quizalofop-p-ethyl, a Group 1 (formerly Group A) herbicide. It has been specifically formulated to provide extra safety to CoAXium barley varieties in a broad range of conditions.

The release of CoAXium barley in Australia is a collaboration between:



Albaugh LLC, a global crop protection manufacturer;



Australian Grain Technologies, Australia's largest plant breeding company; and,



Sipcam, the Australian distributor of Aggressor herbicide.

Australian grain producers are the first in the world to have access to the CoAXium Production System for barley. This manual provides guidelines to safeguard the efficacy of this important technology.



Growing CoAXium barley

The agronomic features of CoAXium barley varieties are described in variety fact sheets available at agtbreeding.com.au. There are no regulatory controls on the crop and there is no need for segregation for domestic or overseas consumption. There are no residues in grain from using Aggressor (MRL = LOQ) and the grazing MRL will not change from what is approved for pastures. However, weed control will be quite different, starting with the management of seed lines on the farm.

Aggressor herbicide from Sipcam

Aggressor contains the active ingredient quizalofop-p-ethyl, a Group 1 herbicide. Aggressor has been specifically formulated to provide extra safety to CoAXium barley varieties in a broad range of conditions. Aggressor is the only herbicide registered by the APVMA and endorsed by AGT for use on CoAXium barley varieties. The use of other quizalofop-p-ethyl or Group 1 herbicides may lead to crop damage and potential yield loss. In addition, the use of other Group 1 herbicides may lead to residues in grain not approved in Australia or by countries importing CoAXium barley.

Managing herbicide resistance

There is widespread resistance to Group 1 herbicides in Australia, particularly in annual ryegrass and to a lesser extent, in barley grass and brome grass. While a range of herbicides are available to control grass weeds in canola, pulse crops and pastures, there are relatively few effective options in cereals. As such, the introduction of Aggressor Herbicide and CoAXium barley varieties provides the opportunity to control grass weeds during the barley phase of the cropping cycle.

All Group 1 herbicides (e.g. 'fops', 'drams' and 'dens') have the same risk of resistance. The frequent application of Group 1 herbicides to dense weed populations can increase selection pressure for resistance. If resistance to a Group 1 herbicide is suspected or known to exist, there is a strong possibility of cross-resistance to other Group 1 and Group 0 herbicides.

Industry guidelines recommend the following practices for managing resistance to Group 1 herbicides:

- Rotating between different herbicide modes of action within the same growing season and from year to year.
- Applying two (or more) different herbicide modes of action on a particular weed population and at times of the growing season. For example:
 - A knockdown herbicide (e.g. glyphosate or paraquat) on emerged target weeds before planting.
 - A pre-emergent herbicide (e.g. pyroxasulfone, triallate or trifluralin).
 - A post-emergent herbicide with a different mode of action.
- Management practices to reduce seed banks, e.g. stubble or header row burning, fallow weed control, varied sowing dates, competitive crops and varieties, green manuring, crop/pasture topping, grazing and collection and/or destruction of weed seed at harvest.
- Preventing the introduction or spread of weeds via contaminated seed, grain, livestock, machinery or hay.
- Rotating between crops and varieties to facilitate the use of different herbicide modes of action.
- Identifying and monitoring surviving weed populations.
- Confirming the resistance status of weed populations using a commercial testing service, such as:
 - Plant Science Consulting plantscienceconsulting.com.au
 - Charles Sturt University csu.edu.au/plantinteractionsgroup

For further information on resistance management strategies, consult your agronomist, farm consultant, government advisor, the GRDC Integrated Weed Management Manual (grdc.com.au), CropLife Herbicide Resistance Management Strategies (croplife.org.au) and Weedsmart Big 6 (weedsmart.org.au).

Planning your crop rotation

Crop rotation is a vital component of herbicide resistance management. Crop rotation allows you to incorporate different herbicide modes of action and non-chemical control methods. The goal should be to achieve three seasons of effective control of grass weeds to reduce the seed bank. Herbicides that only provide suppression of brome grass (e.g. Group 2 herbicides, such as mesosulfuron, sulfosulfuron and pyroxsulam) should not be considered as viable rotation options. Rotation between Group 1 and Group 2 herbicides is not recommended due to cross-resistance.

Before growing CoAXium barley varieties, grass weed populations should be minimised via:

- Mechanical destruction of seeds at harvest
- Burning stubble or header rows
- Fallow spraying, including pre-plant
- Pre-emergent herbicides effective on target grasses
- Pasture topping, if applicable

Keep seed clean and segregated

It is essential to keep seed segregated from other varieties and production systems. Silos, grain bins, trucks, augers and farm machinery should be thoroughly cleaned before and after storage, transportation or planting. Harvested grain should be stored in clean storage areas where the identity of the grain can be preserved.

Controlling CoAXium barley volunteers in following crops

CoAXium barley varieties do not have hard seed characteristics and will readily germinate after rainfall, starting from harvest. Selecting a late-sown crop and variety will allow more time for the application of a knock-down herbicide before sowing. In most cases, the control of CoAXium barley volunteers in following crops is no more difficult than conventional barley. Any herbicide (other than Group 1) that is registered for the control of volunteer cereals on the label can be used to control CoAXium barley volunteers. Trials conducted by Sipcam have confirmed CoAXium barley seedlings (2-5 leaf) can be readily controlled by a wide range of pre- and post-emergent herbicides (see Table 1). Selecting a late-sown crop and variety will allow more time for the application of a knockdown herbicide before sowing.

Controlling CoAXium barley volunteers in fallows

Non-selective knock-down herbicides (e.g. glyphosate, paraquat, diquat and glufosinate) can be used to control CoAXium barley volunteers in fallow. In some situations, the application of residual herbicides (e.g. carbetamide) that are effective on volunteer cereals may be useful.

Table 1: Suggested rotation options for the control of volunteer CoAXium barley.

Following crop	Variety	Herbicides
Canola	Triazine Tolerant	Atrazine pre- and early post- emergence
	Roundup Ready*	Approved glyphosate formulation post-emergence
	TT/Roundup Ready*	Atrazine pre-emergence followed by glyphosate post-emergence
	All varieties, including conventional canola	Pre-emergent herbicides, such as propryzamide
	IMI tolerant varieties	Approved IMI formulations (imazapic, imazapyr, imazethapyr, imazamox)
Cereals	Conventional	Pre-emergent herbicides, such as Luximax* (cinmethalin) and Overwatch* (bixlozone), will significantly reduce plant numbers of surface germinating barley.
	IMI tolerant varieties	Approved IMI formulations (imazapic, imazapyr, imazethapyr, imazamox)
Pulse crops	Conventional	Approved IMI formulations (imazethapyr, imazamox). The pre-emergent herbicide Ultro* (carbetamide) controls annual ryegrass, brome grass, barley grass and can reduce plant numbers of surface germinating barley. The use of other Group 1 post-emergent herbicides for this purpose will be discussed in future updates.
	IMI tolerant varieties of lentils and faba beans	Intercept* or Intervix* (imazapyr + imazamox)
Pasture		paraquat +/- simazine



FREQUENTLY ASKED QUESTIONS

Where can I find out more information about the CoAXium Barley Production System?

More information will become available leading up to the launch of the CoAXium cropping program later this year.

Please visit www.coaxium.com.au.

What varieties of CoAXium barley are available?

The first CoAXium barley variety will be released in August 2022.

Where can I source CoAXium barley varieties?

Australian Grain Technologies is the only supplier of CoAXium barley varieties in Australia. CoAXium barley varieties can be identified by the AX suffix in their name.

Please visit agtbreeding.com.au

Do I have to complete a stewardship course to use the CoAXium Barley Production System?

Yes. Growers must complete the online stewardship registration process before purchasing CoAXium barley seed. The adoption of these stewardship guidelines is vital to safeguard the efficacy of this important technology.

Please visit coaxium.com.au/stewardship

Do I have to use Aggressor herbicide in CoAXium barley varieties?

No. CoAXium barley varieties can be grown without the use of Aggressor herbicide, as per conventional varieties, if desired.

Can I use other quizalofop-p-ethyl formulations or Group 1 herbicides with CoAXium barley varieties?

No. Aggressor is the only herbicide registered for application to CoAXium barley varieties. Aggressor has been specifically formulated to provide extra safety to CoAXium barley varieties in a broad range of conditions. The use of other quizalofop-p-ethyl or Group 1 herbicides may lead to crop damage and potential yield loss or unacceptable grain residues. Numerous trials conducted by Sipcam in Australia over several years have confirmed the efficacy and crop safety of Aggressor herbicide when applied to CoAXium varieties of barley. No other manufacturer can guarantee the safety of other quizalofop-p-ethyl formulations or Group 1 herbicides when applied to CoAXium barley varieties.

What is the cost involved with using the CoAXium Barley Production System?

CoAXium varieties will be under the End Point Royalty (EPR) system, whereby the crop grower pays a royalty based on production rather than a set fee. Aggressor herbicide will be cost-effective in comparison to existing herbicides being used for the control of grass weeds in barley crops.

Where can I sell grain grown using the CoAXium Barley Production System?

Grain grown using the CoAXium Barley Production System can be sold to any market as conventional barley.



Sipcam Pacific Australia Pty Ltd
Level 1, 191 Malop Street,
GEELONG VICTORIA 3220
1300 130 633