Australian Government
Department of Health and Ageing
Office of the Gene Technology Regulator

Policy on Post Harvest Crops

Crops permitted on GM brassica and GM cotton trial sites during the post harvest monitoring period

This document provides guidance to DIR licence holders and applicants on crops that may be grown during the post harvest monitoring period after field trials. Currently this advice is limited to field trials of GM brassica (*Brassica napus, Brassica juncea*) and GM cotton.

Most DIR licences issued by the Gene Technology Regulator for limited and controlled releases ('field trials') of GM plants include post harvest monitoring (PHM) obligations. These include the detection and destruction of any volunteer GM plants at the location where the trial has occurred to ensure that the GMOs do not persist or proliferate at the site or disseminate from the site. For PHM obligations to cease, site 'sign-off' is required. To qualify, the licence holder must be able to demonstrate that the site has been free of GM volunteers for a specified period of time.

DIR licences allow certain non-GM crops to be planted on trial sites subject to PHM. Licence holders frequently seek *ad hoc* variations to licence conditions to permit the growing of crops during PHM that were not authorised in the licence.

However the detection and timely control of volunteer GM plants can be impeded by some post harvest crops and associated agronomic practices because of plant density, height and morphology, or soil disturbance. Failure to detect and control volunteer GM plants may result in the extension of the PHM period and delay site sign-off.

The OGTR has assessed a number of crops commonly proposed for growing during PHM and has developed lists of crops that are permitted on GM brassica and GM cotton PHM sites, respectively. These are set out in the attached two tables. Additional information relevant to volunteer detection is included for each crop type. The lists are based on the observations and experience gained through monitoring a large number of GM brassica and GM cotton trial sites and associated post harvest crops.

The lists inform DIR licence holders and applicants which crops the Regulator permits during the PHM period. They enable licence holders to better plan their post harvest activities, thereby streamlining the post harvest crop approval process and reducing the need for *ad hoc* variation requests.

Licence holders should note that for any post harvest crop **NOT** listed in the relevant table, and that is not explicitly authorised in the licence, written approval **MUST** be obtained from the Regulator **BEFORE** planting that crop. Proposals for post harvest crops not listed in the relevant table will be considered on case by case basis.

This information will be reviewed periodically. Tables of post harvest crop options for other GM crops will be developed as required. For more information please contact the OGTR on 1800 181 030

Table 1. Post harvest crops permitted for GM brassica field trial sites

CROP TYPE	COMMENTS
Bahia grass (*Paspalum notatum*)	Typically fibrous, rhizome like stolons, producing shoots of only up to 20-30 cm height. Easy detection of volunteers. Excellent for forage purposes and also a good soil binder.
Beans - adzuki , green, navy, lablab, burgundy, soy, broad, faba	Height typically less than 1m with capacity to be grown at high density but with slow growth and limited climbing capacity.
Blackgram (*Vigna mungo*)	Grows to a height of up to 80 cm, erect, sub-erect or trailing. Distinct legume hairy leaf morphology makes brassica volunteers detection easy. Recommended spacing between rows 50 -70 cm.
Brinjal (Egg plant) (*Solanum melongena*)	Height typically up to 50- 60cm, leaves typically large and lobed. Typically annual, short duration. Stems and leaves hairy, purple flowers, easy to distinguish from canola plants.
Cereals but not corn/maize or sorghum	Distinct morphology & relative ease of volunteer detection. Maize typically has a height up to 2m and volunteers difficult to identify once established. Sorghum typically has a height up to 2m, volunteers hard to identify once established despite significantly different morphology to brassicas.
Chickpeas	Height typically up to 60cm, can be planted at high density producing dense canopy. Slow emergence facilitates early volunteer detection.
Chillies (*Capsicum* sps)	Best suited for dry and hot weather conditions. Grows to a height of around 60-100 cm, glabrous and pubescent lanceolate leaves clearly distinguishes from canola leaves.
Coriander	Competes poorly during early growth. Distinct morphology and relative ease of volunteer detection.
Cowpea (*Vigna unguiculata*)	Determinate types grow to a height of around 50 cm. Distinct morphology and relative ease of volunteer detection.
Fenugreek	Distinct morphology and relative ease of volunteer detection.
Greengram (*Vigna radiata*)	Grows to a height of 15cm – 1 metre. Legume hairy leaf morphology is distinguishable from canola seedlings. Recommended row spacing is 40 – 60 cms.
Lentils	Height typically up to 40cm, planted at high density with dense canopy but volunteers penetrate canopy before flowering.
Lucerne	Height typically up to 40cm and volunteers penetrate canopy before flowering therefore should be visible and easily targeted for destruction.
Lupin	Distinct morphology and relative ease of volunteer detection.
Mint	Height typically less than 1m, distinct morphology and relative ease of volunteer detection.
Onions	Height typically less than 1m planted at high density. However volunteers break through canopy before flowering and onion morphology is significantly different to brassicas.
Pasture species (including grass and broadleaf species)	Distinct morphology, low cover & relative ease of volunteer detection.
Peanuts	Height typically up to 50cm in prostrate or bush form. Can be planted at high density but volunteers break through canopy before flowering.
Pyrethrum	Height typically up to 75cm. Distinct morphology and relative ease of volunteer detection.
Safflower (*Carthamus tinctorius*)	Short statured varieties grow upto 50-60 cm high, erect annual, with wider spacing, volunteer detection could be easy. Plants with spines.
Sesame (*Sesamum indicum*)	Height typically up to 60 cm to 1 mtr, slow growing in the first 30 days, but picks up in the next 35 days. Volunteers should break through the canopy for easy detection. Fast maturing cultivars come to harvest in 85-90 days. Opposite leaves are oblong and lanceolate with fine hair. Recommended row spacing is 50 – 75 cm.

Sunflowers (*Helianthus annuus*)	Short stature varieties grow to a height of 50 – 60 cm. Erect growth and broad leaf orientation leaves room for easy detection of volunteers. Recommended row spacing 45 – 50 cm.
Vetch	Height typically up to 50cm in dense bushing pattern but enabling volunteers to break through canopy before flowering.

Table 2. Post harvest crops permitted for GM cotton field trial sites

CROP TYPE	COMMENTS
Bahia grass (*Paspalum notatum*)	Typically fibrous, rhizome like stolons, producing shoots of only upto 20-30 cm height. Easy detection of volunteers. Excellent for forage purposes and also a good soil binder.
Beans - adzuki , green, navy, lablab, burgundy	Height typically less than 1m with capacity to be grown at high density but with slow growth and limited climbing capacity.
Blackgram (*Vigna mungo*)	Grows to a height of upto 80 cm, erect, sub-erect or trailing. Distinct legume hairy leaf morphology makes cotton volunteers detection easy. Recommended spacing between rows 50 -70cm.
Brinjal (Egg plant) (*Solanum melongena*)	Height typically up to 50- 60cm, leaves typically large and lobed. Typically annual, short duration. Stems and leaves hairy, purple flowers, easy to distinguish from cotton plants.
Cereals but not corn/maize or sorghum	Distinct morphology & relative ease of volunteer detection. Maize typically has a height up to 2m and volunteers difficult to identify once established. Sorghum typically has height up to 2m, volunteers hard to identify once established despite significantly different morphology to cotton.
Chickpeas	Height typically up to 60cm, can be planted at high density producing dense canopy. Slow emergence facilitates early volunteer detection.
Chillies (*Capsicum* sps)	Best suited for dry and hot weather conditions. Grows to a height of around 60-100 cm, glabrous and pubescent lanceolate leaves clearly distinguishable from cotton leaves.
Coriander	Competes poorly during early growth. Distinct morphology and relative ease of volunteer detection.
Cowpea (*Vigna unguiculata*)	Determinate types grow to a height of around 50 cm. Distinct morphology and relative ease of volunteer detection.
Fenugreek	Distinct morphology and relative ease of volunteer detection.
Greengram (*Vigna radiata*)	Grows to a height of 15cm – 1 metre. Legume hairy leaf morphology is distinguishable from cotton seedlings. Recommended row spacing is 40 – 60 cms.
Lentils	Height typically up to 40cm, planted at high density with dense canopy but volunteers penetrate canopy before flowering.
Lucerne	Height typically up to 40cm and volunteers penetrate canopy before flowering therefore should be visible and easily targeted for destruction.
Mint	Height typically less than 1m, distinct morphology and relative ease of volunteer detection.
Onions	Height typically less than 1m planted at high density. However volunteers break through canopy before flowering and onion morphology is significantly different to cotton.
Pasture species (including grass and broadleaf species)	Distinct morphology, low cover & relative ease of volunteer detection.
Peanuts	Height typically up to 50cm in prostrate or bush form. Can be planted at high density but volunteers break through canopy before flowering.
Pigeon pea* (* only with specific management conditions)	Height typically above 1m, dense, bushy. *Permitted only if grown as a refuge crop+ with the following conditions: • plants must be spaced at no more than 7 plants per m along the row; • plants must be planted in rows >1m apart; • plants must be destroyed by being slashed, ploughed in or grazed by livestock before reaching a height of 1m; • not to be used as a food crop;

	• the OGTR must be notified within 21 days of planting.
Pyrethrum	Height typically up to 75cm. Distinct morphology and relative ease of volunteer detection.
Radish	Height typically up to 1m and can be planted at high density however volunteers may be detected.
Safflower (*Carthamus tinctorius*)	Short stature varieties grow upto 50-60 cm high, erect annual, with wider spacing, volunteer detection could be easy. Plants with spines.
Sesame (*Sesamum indicum*)	Height typically up to 60 cm to 1 mtr, slow growing in the first 30 days, but picks up in the next 35 days. Volunteers should break through the canopy for easy detection. Fast maturing cultivars come to harvest in 85-90 days. Opposite leaves are oblong and lanceolate with fine hair. Recommended row spacing is 50 – 75 cm.
Sunflowers (*Helianthus annuus*)	Short stature varieties grow to a height of 50 – 60 cm. Erect growth and leaf orientation leaves room for easy detection of volunteers. Recommended row spacing 45 – 50 cm.
Vetch	Height typically up to 50cm in dense bushing pattern but enabling volunteers to break through canopy before flowering.

[+] refuge crop refers to a crop grown under APVMA conditions for insect resistance management