

WEED CONTROL IN WHEAT

Adapted from ARC (2019)

Weed control in any small grain production system can be very daunting, especially with the development of herbicide-resistant weeds. The occurrence of weed in wheat has been documented to decrease the wheat yield with up to 33%. Throughout the past seasons, it has become clear that many post-emergence herbicides don't control grassweeds anymore. Many producers had to move to an integrated weed management system (IWM) and now focus more on pre-emergence herbicide control strategies.

Before any control strategies can be implemented, it is very important to identify the weed you want to control correctly. This is important because different weeds will be killed by different herbicides and at different dosages. By using the incorrect herbicide and/or dosage, the selection will favour the herbicide-resistant weeds. Some of the most troublesome or widespread weeds in the summer rainfall region will be discussed. The registered herbicide lists were compiled from the book: "A Guide for the Chemical Control of Weeds in South Africa".

It is a CropLife/AVCASA South Africa Compendium and was compiled by Kathy van Zyl (http://www.efekto.co.za/wp-content/uploads/mixing_labels/Herbicide%20guide.pdf).

Fallopia convolvulus (Wild Buckwheat)

Wild buckwheat is a slender, twining annual plant with a deep taproot system. The stems are round and hairless with scabby stripes, while the leaves are simple and alternately arranged. The leaves are also triangular with a pointed apex and a heart-shaped base. The leaves are hairless and scabby and grow up to 5.5cm long and 4.5cm wide. The flowers of wild buckwheat are small, green or white of colour and are arranged in bundles on the axillary axes. The seeds are black, sharp triangular nutlets. They are hairless, shiny and are usually covered with a persistent, brown perianth segment. The seeds can be 3mm long and 2.5mm wide. (Fig. 1)

Wild buckwheat is widespread in southern Africa and can be a severe competitor with crops. This weed can climb up against other crops and compete with the crop to such an extent that the crop may die. It is an especially troublesome weed in the Eastern Free State. (Fig. 2). This weed can be

relatively tolerant to some herbicides, especially hormone-type herbicides. Several herbicides are registered for use on this weed (Table 1). As with all herbicides, please follow the instructions and dosage recommendations on the label.



Figure 1. Wild buckwheat seedling



Figure 2. Wild buckwheat in an oats field

Table 1: Broadleaved herbicides registered for the control of wild buckwheat in wheat

Active Ingredient	Formulation	Time of application
2,4-D	480 g/ℓ	Apply at growth stage 7-13 of the wheat
	500 g/ℓ	ONLY in the summer rainfall areas (not KZN). Apply at growth stage 7-13 of the wheat
aminopyralid	240 g/ℓ	Weed before leaf stage 4
bromoxynil	225 g/ℓ	Weeds must be fully germinated, but not older than 6 leaf stage
	400 g/ℓ	Apply when crop is between 3-leaf stage and the end of the stooling stage
	450 g/ℓ	Weeds must be fully germinated, but not older than 6 leaf stage
	500 g/ℓ	Wheat seedlings should be between the 3-leaf and end of booting stage
chlorsulfuron	750 g/kg	Wheat in 2-5 leaf stage
chlorsulfuron/metsulfuron-methyl	375/300 g/kg	Weed in leaf stage 3-4
chlorsulfuron/metsulfuron-methyl/tribenuron-methyl	119/79/222 g/kg	Eastern Cape. Wheat must be in 4-6 leaf stage
dicamba	700 g/kg	Only to be used in a tank mix with Enhancer (10-12 g) + Reaper (10 g) + adjuvant
MCPA	400 g/ℓ	Apply at growth stage 7-13 of the wheat
	700 g/kg	In dry land, Apply at growth stage 7-13 of the wheat
metsulfuron-methyl/thifensulfuron-methyl	68/680 g/kg	Apply before 4-5 leaf stage of the weed
prosulfuron	750 g/kg	Apply before 4-5 leaf stage of the weed
thifensulfuron-methyl	750 g/kg	Eastern Cape. Only in tank mix with Enhancer + adjuvant, wheat must be 2-5 leaf stage, but not later than 4 weeks after weed emergence
tribenuron-methyl	750 g/kg	Irrigated wheat, when wheat is in 3-5 leaf stage

Chenopodium album (White goosefoot, fat hen, wild spinach)

Chenopodium is an annual, multi-branched, erect herb that can grow as tall as 1.5m. This weed has a sturdy taproot and the stems are ribbed, green-yellowish, often reddish striped and hairless. The leaves are simple, alternately arranged and vary from lancet-shaped to egg-shaped. The leaf margins can be entirely or irregularly toothed and are dark green at the top and floury white below. Seedlings can appear woolly due to the white colouring of the young leaves. Leaves can be 5cm long and 3cm wide. The flowers of *Chenopodium* are green and the seeds are black and shiny. (Fig. 3). *Chenopodium* is widespread in South Africa, is frost tolerant and occurs regularly in winter crops. This weed is commonly referred to as ‘morog’, but this weed must not be confused with *Amaranthus* species which are also edible. *Chenopodium* can be controlled through shallow cultivation at the

seedling stage. (Fig. 4). The most effective way to control this weed is by using herbicides. Several herbicides are registered for use on this weed (Table 2). Follow the instructions and dosage recommendations on the label. Be aware that green goosefoot is also a *Chenopodium* spp. (*C. carinatum*) and while most of the herbicides listed in Table 2 will control green goosefoot, it is still necessary to make sure which *Chenopodium* spp. is indicated on the herbicide label.



Figure 3. Young *Chenopodium* plant



Figure 4. *Chenopodium* seeds

Table 2: Broadleaved herbicides registered for the control of white goosefoot in wheat

Active Ingredient	Formulation	Time of application
2,4-D	480 g/l	Apply at growth stage 7-13 of the wheat
	500 g/l	ONLY in the summer rainfall areas (not KZN). Apply at growth stage 7-13 of the wheat
2,4-DB	400 g/l	Undersowed lucerne in grain crops, wheat must be between leaf stage 5 and full tillering, READ THE LABEL
aminopyralid	240 g/l	Weed before leaf stage 4
bendioxide	480 g/l	Apply on young, actively growing weeds
bromoxynil	225 g/l	Weeds must be fully germinated, but not older than 6 leaf stage
	400 g/l	Apply when crop is between 3-leaf stage and the end of the stooling stage
	450 g/l	Weeds must be fully germinated, but not older than 6 leaf stage
	500 g/l	Wheat seedlings should be between the 3-leaf and end of booting stage
carfentrazone-ethyl/ metsulfuron-methyl	400/100 g/kg	Eastern Cape. Wheat must be in 3-5 leaf stage
chlorsulfuron	750 g/kg	Wheat in 2-5 leaf stage
chlorsulfuron/ metsulfuron-methyl	375/300 g/kg	Weed in leaf stage 3-4
chlorsulfuron/ metsulfuron-methyl/ tribenuron-methyl	119/79/222 g/kg	Eastern Cape. Wheat must be in 4-6 leaf stage
dicamba	700 g/kg	Only to be used in a tank mix with Enhancer (10-12 g) + Reaper (10 g) + adjuvant
fluroxypyr/triclopyr	240/120 g/l	Weed in leaf stage 2-10
MCPA	400 g/l	Apply at growth stage 7-13 of the wheat
	700 g/kg	In dry land, Apply at growth stage 7-13 of the wheat
metsulfuron-methyl/ thifensulfuron-methyl	68/680 g/kg	Apply before 4-5 leaf stage of the weed
metsulfuron-methyl/ tribenuron-methyl	120/600 g/kg	Only in tank mixture with 2,4-D Ester or Voloxynil B 225 EC
prosulfuron	750 g/kg	Apply before 4-5 leaf stage of the weed
thifensulfuron-methyl	750 g/kg	Eastern Cape. Only in tank mix with Enhancer + adjuvant, wheat must be 2-5 leaf stage, but not later than 4 weeks after weed emergence
triasulfuron	750 g/kg	Eastern Cape, apply at planting
tribenuron-methyl	750 g/kg	Irrigated wheat, when wheat is in 3-5 leaf stage
trifluralin	480 g/l	Use only in planted fields, dosage depends on weed species

***Avena fatua* (Common wild oats)**

Wild oats is an annual (annual = goes through whole life cycle within a year) grass, which can be between 60-90cm tall. The stems are solitary or often tufted. The culms are erect and hairless and have two to five nodes. The leaf sheaths are also hairless and can grow as long as 20cm. The leaves, which are also hairless, are linear and have sharp apices and can grow up to 24cm long and 8mm wide. The ligule is membranous and can be up to 6mm long. The inflorescence of wild oats is open, loose panicles that can grow up to 40cm long. The spikelets are oblong, narrow, gaping and contain two to three florets. Each lemma has a bent and twisted awn, with a darkly coloured

underside. The seeds look like typical oat seeds. The seed can be 9mm long and 2mm wide. (Fig. 5). Wild oat is a severe competitor and commonly occur in the Southern Cape Province and the grain

producing areas of the Free State, especially in monoculture wheat production. The seed of wild oats usually gets distributed through contaminated wheat seed and contaminated machinery. (Fig. 6). Post-emergence herbicides are applied after the weed and/or crop has emerged from the soil. Several herbicides are registered for the control of wild oats in wheat Table 3). Please follow the specific instructions and dosage recommendations on the chosen products label. Always consult the label before spraying any herbicide.



Figure 5. *Avena* plant



Figure 6. *Avena* spikelets

Table 3: Grass weed herbicides registered for the control of wild oats in wheat

Active Ingredient	Formulation	Time of application
clodinafop-propargyl	240 g/ℓ	Apply when the weeds are in the 2-4 leaf stage. Dosage depends on the weed species and method of application
diclofop-methyl	378 g/ℓ	ONLY use in irrigated wheat. Apply before the crop reaches the 5 leaf stage
fenoxaprop-P-ethyl	120 g/ℓ	Apply when weeds are in the 3-5 leaf stage. Dosage depends on weed species, growth stage and method of application
flucarbazone-sodium	700 g/kg	Wheat in leaf stage 3-5
pinoxaden	45 g/ℓ	Dosage depends on the grass species
pyroxsulam	45 g/ℓ	Apply post-emergence between the 2-3 leaf stage of the wheat until the 2 node stage when the weeds are in the seedling stage
tralkoxydim	100 g/ℓ	Post-emergence in irrigated wheat. Apply when the weeds are in the 2-4 leaf stage
Triallate	480 g/ℓ	Eastern Cape, Pre-emergence, apply to well prepared seedbed just before planting and incorporate with an airseed planter within 4 hours
triasulfuron	750 g/kg	Apply at planting

Herbicide resistance in this weed has been documented and poor control has been reported from all over South Africa. Producers and chemical advisors must always take herbicide resistance into account when making herbicide recommendations. Never use products to which resistance has been noted on specific fields/farms. Always make use of a reliable chemical advisor before buying and/or using any chemicals and follow the label recommendations strictly.

Amaranthus hybridus (Common pigweed, Cape pigweed, redshank)

Common pigweed is an erect, multi-branched, hairless, annual herbaceous plant. It can grow up to 90cm long, but much higher in subtropical conditions. The stems are green to brown and sometimes it is redly tinged and strongly ribbed. The leaves are simple, alternately arranged and broad lancet-shaped. It can be up to 6cm long and 3cm wide. The margins of the leaves can be entire and the veins are more distinct on the lower surface of the leaf. Leaf stalks can sometimes be as long as 5cm. Flowers are borne in dense terminal and axillary spikes and are unisexual, with male flowers at the top of the spike and the more numerous female flowers at the bottom. The flowers are straw-coloured. Fruits of common pigweed are small bladder-like fruits, that are dehisced by lids. The

seeds are small, shiny, dark brown to black and lens-shaped. (Fig. 7 & 8). Common pigweed is one of the most abundant and widely distributed broadleaved weeds of cultivated fields in southern Africa. Common pigweed is easy to control with shallow cultivation when the weed is still in the seedling stage. Various pre- and post-emergence broadleaf herbicides can be used to control common pigweed effectively (Table 4).



Figure 7. Common pigweed plant



Figure 8. Common pigweed seed



Table 4: Broadleaved herbicides registered for the control of common pigweed in wheat

Active ingredient	Formulation	Time of application
2,4-D	480 g/l	Apply at growth stage 7-13 of the wheat
2,4-DB	400 g/ℓ	Undersowed lucerne in grain crops, wheat must be between leaf stage 5 and full tillering, READ THE LABEL
2,4-D/dicamba	240/80 g/l	Apply at growth stage 7-13 of the wheat
bendioxide	480 g/l	Apply on young, actively growing weeds
bromoxynil	225 g/l	Weeds must be fully germinated, but not older than 6 leaf stage. Wheat seedlings should be between the 3-leaf and end of booting stage
	400 g/l	
	450 g/l	
	500 g/l	
chlorsulfuron/metsulfuron-methyl	375/300 g/kg	Weed in leaf stage 3-4
dicamba	700 g/kg	Only to be used in a tank mix with Enhancer (10-12 g) + Reaper (10 g) + adjuvant
halosulfuron	750 g/kg	In mixtures (See label)
fluroxypyr/triclopyr	240/120 g/ℓ	Weed in leaf stage 2-8
MCPA	400 g/l	Apply at growth stage 7-13 of the wheat
	700 g/kg	
trifluralin	480 g/l	Before planting