



# A landowner's guide to **ALIEN GRASSES** and the prevention of their spread

## What are alien grasses?

Alien grasses are grass species that have been introduced by people or animals to areas outside their place of origin. Most alien grasses come from Europe, Asia and South America but some also come from other parts of Africa. Invasive alien grasses are a serious weed threat with the potential to spread considerably and quickly. Originally introduced either as pasture grasses, accidentally through contaminated cereal crop seed, or in the wool of livestock, these species are often unpalatable to livestock, out-compete indigenous plant species and degrade natural veld. Alien grasses are most common in disturbed areas and can often be seen at the edges of cultivated fields and along road verges.

Grasses are either annual or perennial. Annual grasses complete their life cycle - germinating from seed, growing, flowering, setting and dispersing seed - all within a single year. Examples of invasive annual grasses are: wild oats (*Avena fatua*), rye grass (*Lolium sp*), quaking grass (*Briza sp*), ripgut/predikantsluis (*Bromus diandrus*), and rats tail (*Vulpia myuros*). Annual invasive grasses have seeds with barbs and are most often spread by livestock or indigenous herbivores.

Perennial grasses have a long life cycle. They can survive repeated fires or grazing pressure by sprouting, and can also spread vegetatively by runners or by seed. Examples of invading perennial grasses are: thatching grass (*Hyparrhenia hirta*), kikuyu (*Pennisetum clandestinum*) and weeping love grass (*Eragrostis curvula*).

## Why are alien grasses a problem in fynbos and renosterveld?

The adverse impact of invasive woody alien vegetation such as black wattle, rooikrans and port jackson is well known. While invasive alien grasses are less visible than these species, their impact is no less significant, especially in lowland areas close to agricultural activities. **Alien grasses out-compete indigenous annuals and bulb species that make up an important part of species diversity in renosterveld and fynbos.** These grasses produce numerous long life seeds that are easily dispersed with wind or on the hides of animals, and can survive in the soil for long periods. **Alien grasses also change the fuel load of the veld, causing more frequent, and hotter fires.** Frequent fires can lead to the loss of indigenous annuals and bulbs whose seeds cannot survive intensely hot fires.

## How can alien grass invasion be avoided?

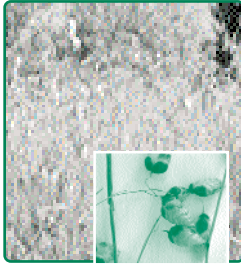
1. Alien grasses survive particularly well in moist areas (south facing slopes or stream banks) and in nutrient-rich soils. Nutrient-rich soils tend to occur where there is fertilizer run-off from surrounding agricultural lands or where animals congregate, such as dams and drinking points. To avoid invasion of alien grasses from agricultural lands into natural fynbos and renosterveld fragments, **ensure that there is an uncultivated buffer of at least 20m between fields and natural veld.**
2. Many alien grasses, especially annual species, have seeds adapted to dispersal via large herbivores and livestock. **To avoid dispersal of seed by animals, prevent livestock grazing in areas infested by alien grasses while these species are seeding between August and November.** If livestock has grazed pasturelands between August and November, keep them out of the natural veld areas. In general, moving livestock from old lands or planted pasture into conservation-worthy, natural vegetation, will aid the spread of alien grasses.
3. Frequent fires favour alien grass invasion, as burnt veld is more open, receives more light and has a higher nutrient content than unburnt veld. **Ensure that, if stubble is burnt, the fire does not spread into natural veld fragments.**
4. Alien grasses will also invade renosterveld and fynbos areas recently cleared of woody alien trees. Follow-up operations should, therefore, take this into account.

## How to control/remove alien grasses

Research has recently been conducted into the most effective control methods for alien grasses. Methods investigated include burning, mowing, hand clearing and applying herbicides. The findings are as follows:

- **Burning** stimulates alien grasses and is not an effective means of control.
- **Hand clearing** that disturbs the soil actually promotes alien grass growth.
- **Mowing** dense stands of annual grasses while the grasses are flowering and before the seed has set (around September) is fairly effective. Mowing before June or after September has little effect. Please note that the brushcutting of indigenous shrubland to remove annual grasses is not recommended.
- **Applying herbicide is the most effective alien grass control method.** Pre-emergent systemic herbicides, like the following, are most effective:
  - 1) **Snapshot, Dow Agro-Sciences** (active ingredients include **Trifluralin** and **Isoxaban**) at a dosage of **2.5kg/100m<sup>2</sup>**. Cost per ha including labour is approximately R13 400 (as calculated in 2005).
  - 2) **Gallant Super** (®-2-(4 (-3-chloro-5-(trifluoromethyl)-3-pyridinyl-oxy-phenoxy-propanoic acid methyl)). Cost per ha including labour is approximately R36 000 (as calculated in 2005).

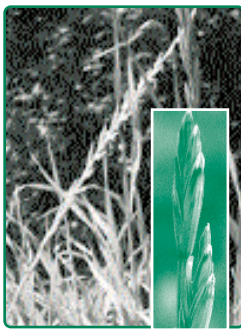
# MAJOR ALIEN GRASSES



**Briza maxima**

## **Briza maxima** (large quaking grass/bewetjies) and **Briza minor** (small quaking grass/klein bewertjies)

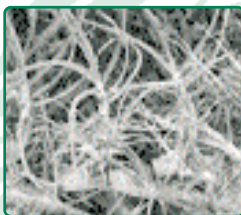
Both *Briza* sp. were introduced to South Africa from the Mediterranean, probably as ornamentals. The spikelets of *B. minor* are considerably smaller than those of *B. maxima*. They are now commonly found throughout the southern Cape, mostly on well-drained soils. Both are weeds found on roadsides, in orchards, gardens and occasionally in irrigated crops. Both species can be controlled with the use of herbicides.



**Lolium temulentum**

## **Lolium multiflorum** (Italian ryegrass/Italiaanse raaigras) and **Lolium temulentum** (darnel/drabok)

Both species are originally from Europe and are now widespread in cultivated lands, gardens and other disturbed places, often forming hybrids with other species. The ryegrasses have been hybridised and bred as high performance pasture grasses but often escape into the wild. *L. multiflorum* can become infested with the nematode *Anguina agrostis* and the bacterium *Corynebacterium rathayi* and which, together, can cause fatal poisoning of livestock. The first sign that ryegrass is infected is the presence of a yellow bacterial slime, usually occurring on the inflorescence during September. *Lolium* is especially difficult to control when it occurs in cereal crops. Both species are sensitive to most selective grass and wild oats herbicides. Where practical, they can easily be removed by hand in the seedling phase.



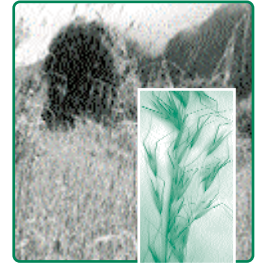
**Pennisetum clandestinum**

## **Pennisetum clandestinum** (kikuyu/kikoejoe)

*P. clandestinum* was introduced from East Africa and is now widely found in South Africa, both as a cultivated plant and as a weed. It is a robust, perennial and creeping species that grows in well-drained, fertile soil, in damp soil, and in disturbed places in high rainfall areas. **Glyphosate** foliar spray (active ingredient in Mamba and Round-up) is recommended for general control at 3% concentration. This grass is frost-sensitive so winter ploughing and discing is also fairly effective, however, remaining runners spread rapidly in suitable conditions. It is not susceptible to pre-emergent herbicides unless it is growing from seed.

## **Avena fatua** (common wild oats/gewone wildehawer)

*A. fatua* is a major grass weed occurring all over the world and introduced to South Africa from Europe or Asia. It is easily confused with *A. sativa* (the well known oats crop) and *A. barbata* (wild beard oats) but can be recognised in wheat fields, at an early stage, by its flatter growth habit and hairs at the base of the leaf. *A. fatua* is usually spread by means of contaminated wheat seed and via machines like combine harvesters. It becomes highly competitive and is hard to control by means of crop rotation as its seed can lie dormant in the soil for up to nine years. Selective post-emergence herbicides are recommended for winter wheat crops in dryland conditions. Since *A. fatua* is closely related to cereal crops, the registered herbicides need to be highly selective and specialised.



**Avena fatua**

## **Bromus pectinatus** (Japanese brome) and **Bromus diandrus** (rippgut brome/predikantsluis)

*B. pectinatus* was introduced from Eurasia while *B. diandrus* was introduced from the Mediterranean in contaminated feed grain. *B. diandrus* has hybridised with a close relative, creating what is referred to as an 'aggregate'. Seedlings have distinctive striped leaf sheaths and leaves are hairier than the wheat of other common grass weeds in the western Cape. *B. diandrus* is a competitive weed that is avoided by stock and is a host for cereal root diseases. Its growth is encouraged by wheat monoculture and reduced tillage. Control of both species is especially difficult as they do not respond well to selective herbicides. Light burning in April assists in suppressing these grasses.



**Bromus diandrus**

## **Vulpia myuros** (rats tail fescue/langbaadswenkgras/wildegars)

Introduced from Europe, *Vulpia myuros* is now a serious annual grass weed found mainly in the southern and eastern Cape. It is a common weed at roadsides, in waste sites, gardens and lucerne. The grass is difficult to control once it has become established and does not respond to most selective grass killers. Control must be initiated when the grasses are small.



**Vulpia myuros**

### References

#### Information on alien grasses:

Bromilow, C., 2001. Problem Plants of Southern Africa. Briza Publications.  
Van Oudtshoorn, F., 2002. Guide to Grasses of Southern Africa. Briza Publications.

#### Information on the impact of alien grasses:

Milton, S.J., 2004. Grasses as invasive alien plants in South Africa. South African Journal of Science 100 pg. 69-75.

#### Information on clearing methods:

Research is currently being done by Charles Musil (021-799 8800, musil@sanbi.org) at the Kirstenbosch Research Centre, South African National Biodiversity Institute.



**CRITICAL ECOSYSTEM PARTNERSHIP FUND**