

◆ **EPPO Standards** ◆

GUIDELINES ON GOOD PLANT PROTECTION PRACTICE

FARM GRASSLAND

PP 2/16(1) English



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APPROVAL

EPPO Standards are approved by EPPO Council. The date of approval appears in each individual standard.

REVIEW

EPPO Standards are subject to periodic review and amendment. The next review date for this set of EPPO Standards is decided by the EPPO Working Party on Plant Protection Products.

AMENDMENT RECORD

Amendments will be issued as necessary, numbered and dated. The dates of amendment appear in each individual standard (as appropriate).

DISTRIBUTION

EPPO Standards are distributed by the EPPO Secretariat to all EPPO Member Governments. Copies are available to any interested person under particular conditions upon request to the EPPO Secretariat.

SCOPE

EPPO guidelines on good plant protection practice (GPP) are intended to be used by National Plant Protection Organizations, in their capacity as authorities responsible for regulation of, and advisory services related to, the use of plant protection products.

REFERENCES

All EPPO guidelines on good plant protection practice refer to the following general guideline:

OEPP/EPPO (1994) EPPO Standard PP 2/1(1) Guideline on good plant protection practice: principles of good plant protection practice. *Bulletin OEPP/EPPO Bulletin* **24**, 233-240.

OUTLINE OF REQUIREMENTS

For each major crop of the EPPO region, EPPO guidelines on good plant protection practice (GPP) cover methods for controlling pests (including pathogens and weeds). The main pests of the crop in all parts of the EPPO region are considered. For each, details are given on biology and development, appropriate control strategies are described, and, if relevant, examples of active substances which can be used for chemical control are mentioned.

Guidelines on good plant protection practice

FARM GRASSLAND

Specific scope

This standard describes good plant protection practice for farm grassland.

This guideline on good plant protection practice (GPP) for grassland forms part of an EPPO programme to prepare such guidelines for all major crops of the EPPO region. It should be read in conjunction with EPPO Standard PP 2/1 Principles of Good Plant Protection Practice. The guideline covers methods for controlling pests (including pathogens and weeds) in farm grassland, both newly sown and established.

Grass is grown in many parts of the EPPO region, as a food source for grazing animals (including hay and silage production), for seed, to improve the landscape, to improve and stabilize the soil surface and for amenity and recreational purposes. This guideline is concerned with grassland production at the farm level and excludes seed production, management of grass for visual amenity and recreational purposes.

It is during the establishment period (reseeding) that grasses are most at risk from pests. GPP for grassland starts with the avoidance of pests before and during establishment. Adequate crop rotation should be practised. Although plant protection products may occasionally be needed to ensure early and rapid establishment, good seedbed preparation and time of sowing can reduce pest damage. As grass is grown from seed, seed treatments with plant protection products are to be preferred to field treatments wherever possible. Thresholds and crop management systems are available to help decisions on the need for and timing of field treatments.

Established grassland supports a larger and more diverse invertebrate population and a wider range of fungal and viral pathogens than most farm crops. Some pests may cause yield losses, but much of the damage to established grassland is insidious. Generally, pests of established grassland are best countered by management practices and the use of resistant cultivars. Manipulation of grassland defoliation and fertilization will reduce the risk and extent of damage caused by most diseases. The use of plant protection products to control pests is usually not cost-effective except in seed crops. To prevent unacceptable residues, a suitable interval must be left between application of products and either harvest or allowing animals to graze treated crops.

Specific approval and amendment

First approved in September 1999.

The principal grassland pests considered are the following:

Grass establishment (reseeding)

- damping-off diseases;
- *Oscinella frit* (frit fly);
- *Tipula* spp. (leatherjackets);
- *Agriotes* spp. (wireworms);
- *Phyllobius pyri* (common leaf weevil);
- slugs;
- weeds.

Established grassland

- *Puccinia coronata* (crown rust);
- *Drechslera* spp. (drechslera leaf spots);
- *Mastigosporium rubricosum* (leaf fleck);
- *Rhynchosporium secalis* and *R. orthosporum* (leaf blotch);
- *Erysiphe graminis* (powdery mildew);
- *Puccinia striiformis* (stripe rust);
- *Claviceps purpurea* (ergot);
- *Monographella nivalis* (snow mould);
- *Xanthomonas campestris* pv. *graminis* (bacterial wilt);
- *Ryegrass mosaic rymovirus*;
- *Tipula* spp. (leatherjackets);
- *Oscinella frit* (frit fly);
- *Agriotes* spp. (wireworms);
- *Phyllopertha horticola* and *Melolontha melolontha* (garden chafer, cockchafer, white grubs);
- aphids;
- *Bibio marci* and *Dilophus febrilis* (bibionids);
- weeds.

In addition, information is given on GPP in the use of herbicides for total grassland destruction.

Explanatory note on active substances

The EPPO Panel on Good Plant Protection Practice, in preparing this guideline, considered information on specific active substances used in plant protection products and how these relate to the basic GPP strategy. These details on active substances are included if backed by information on registered products in several EPPO countries. They thus represent current GPP at least in those countries. It is possible that, for any of numerous reasons, these active substances are not registered for that use, or are restricted, in other EPPO countries. This does not invalidate the basic strategy. EPPO recommends that, to follow the principles of GPP, only products registered in a country for a given purpose should be used.

GRASS ESTABLISHMENT (RESEEDING)

Damping-off diseases

General

Grass seedlings are susceptible to the fungi that cause damping-off in many other crops, i.e. mainly *Pythium* spp. and *Fusarium culmorum* and other *Fusarium* spp. Seedlings may be killed before emergence or their vigour reduced after emergence. Poor establishment caused by damping-off diseases is generally associated with poor seedbed conditions delaying germination and emergence. Cold, wet weather immediately after sowing can aggravate the problem.

Basic strategy

Cultivars show a range of susceptibility to damping-off but, among grass species, *Lolium* spp. are generally more resistant than *Dactylis glomerata* or *Phleum pratense*, with *Lolium multiflorum* more resistant than *Lolium perenne*. Soil and seedbed conditions should be optimal, and use of a fungicidal seed treatment can provide early protection of seedlings.

Main fungicides

Seed treatments: metalaxyl, thiabendazole, thiram.

Oscinella frit (frit fly)

General

Oscinella frit is an important pest of newly established grasses especially *Lolium*, *Festuca* and *Agrostis* spp. Larvae destroy the central shoots of young seedlings resulting in patchy crops and occasional crop failures. In lowland areas, there are three generations a year, with the most damaging attacks on reseeded grass resulting from the third-generation flies that are active in late summer. Damage originates mainly by direct egg-laying onto newly emerged plants. Frit-fly larvae

can also migrate from a previously destroyed grassland into the new reseeded grass. Such attacks can be severe where there is only a short interval between grassland destruction and sowing and especially when grass is reseeded using minimal cultivation or direct-drilling techniques.

Basic strategy

Frit-fly attacks are sporadic and also difficult to observe. Risk is determined by knowledge of pest activity, usually by trapping flies to assess third-generation activity. The main risk is from direct egg-laying onto newly emerged shoots. An insecticide spray can be applied, where necessary, at early crop emergence. The risk of direct transfer of frit fly larvae from an old grassland to the reseeded grassland should be assessed. Although only a small percentage of larvae migrate successfully, these may be sufficient to cause severe damage if plant populations are low. An insecticide spray treatment should be considered when an old grassland is reseeded directly. It is normal GPP to use a combination of methods to control frit fly. Cultural techniques, e.g. time of sowing and leaving an interval of 4-6 weeks between destruction of old grassland and reseeded, avoiding risk of larval transfer, can be used together with insecticide treatment when risk of damage is high.

Main insecticides

Sprays: chlorpyrifos, cypermethrin, triazophos.

Tipula spp. (leatherjackets)

General

Leatherjackets are the larvae of crane flies (*Tipula* spp.). Eggs are laid onto established grassland in early autumn, the larvae feeding slowly during the winter during mild periods. Spring-sown new grassland reseeded into old grassland infested with leatherjackets is often severely damaged, young seedlings being severed at or just below soil level. Highest populations of leatherjackets tend to occur after damp, mild autumns.

Basic strategy

Control relies on the application of a moderately persistent soil-active insecticide. Treatment of the old grassland is recommended if numbers of leatherjackets exceed locally defined thresholds (e.g. 50 per m²). Where an attack is in progress, spring treatment of the reseeded grassland is recommended if populations exceed a lower threshold (e.g. 30 per m²). Cultivation methods can assist in reducing leatherjacket numbers by mechanically killing them and exposing them to bird predators.

Main insecticides

Sprays: *Bacillus thuringiensis* var. *israelensis*, chlorpyrifos, diazinon, dimethoate, etrimfos, fenitrothion, gamma-HCH, phoxim, triazophos.

Agriotes spp. (wireworms)

General

Grassland is the natural habitat of the larvae of certain *Elateridae* (*Agriotes* spp., wireworms). Largest infestations occur in permanent grass but little damage is caused in this crop. When infested old grassland is broken up or desiccated, the reseeded grass is liable to damage. The wireworms chew into the base of the seedlings just below ground level, so that they wilt and turn yellow or die. On newly emerged seedlings, the yellowing of the seedling may resemble damage caused by frit fly; the ragged nature of chewed plants, together with the presence of wireworms in the soil, confirms the diagnosis.

Basic strategy

Thorough cultivations before and during reseeded and consolidation through rolling will help to reduce wireworm numbers. Timely reseeded into good seedbeds with adequate fertilizer will help to reduce the impact of damage by encouraging crop growth. Fields at risk may be sampled before reseeded and, where wireworms are easily found, an insecticide may be applied before drilling. Once an attack is under way, insecticide treatment will have minimal effect and is not recommended.

Main insecticides

Sprays: gamma-HCH, pirimiphos-methyl.
Soil treatment: diazinon.

Phyllobius pyri (common leaf weevil)

General

Adult weevils feed on the leaves of trees and shrubs, while the white legless larvae feed in grassland in late summer and early autumn. When present in large numbers, the weevil larvae damage the roots of grass reseeded in late summer. Attacks are most common on sandy soils in dry seasons.

Basic strategy

Repeated rolling of the reseeded grass when the effects of the larvae are first seen can give some control and will reduce further damage. Insecticides applied to the soil before reseeded to control other soil pests may give some incidental control of *Phyllobius pyri* larvae.

No chemical treatment is specifically recommended for this pest.

Slugs

General

Slugs (e.g. *Agriolimax arvensis*, *Deroceras reticulatum*) damage grass seedlings and can cause extensive losses on medium to heavy-textured soils, particularly in wet seasons. Most damage occurs in the autumn and during mild periods in the winter.

Basic strategy

A firm, consolidated seedbed will restrict slug movement and encourage rapid seedling growth. To assess the risk of slug damage and the need for and timing of molluscicide treatments, test baiting when the soil surface is moist is advised. The normal method of treatment is to scatter molluscicide formulated as a bait a few days before sowing. Alternatively, treatment can be applied after sowing or even soon after germination at an early sign of damage. In high-risk situations, bait pellets can be mixed with the seed. Biological control with *Phasmarhabditis hermaphrodita* is also possible.

Main molluscicides

Metaldehyde, mercaptodimethur.

Weeds

General

The weed species generally found in reseeded grass vary according to whether the land was previously in long-term grass or within an arable rotation. In the former, *Ranunculus* spp., *Taraxacum officinale* and *Rumex* spp. will predominate, but in a rotation *Stellaria media*, *Chenopodium album*, *Veronica* spp. and *Polygonaceae* will be the main targets. Where the reseeded grass is mixed with *Trifolium* spp., the choice and timing of herbicide is more restricted than with pure reseeded grass.

Basic strategy

The aim is to establish a dense, competitive grass stand as soon as possible after reseeded in order to suppress weed growth. This is influenced by grass species, cultivar, quality of seedbed, seed rates, fertilizer treatment and time of sowing. It is possible to control some weeds mechanically by cutting and by grazing animals, but this is usually only effective with very light weed infestations. In most cases, the recommended GPP for reseeded grass is to choose a combination of herbicides which will give cost-effective control of the most competitive species. Pre-emergence herbicides are appropriate only if certain specific difficult weeds are present. Herbicides are

usually applied after emergence, the choice of treatment depending on the weed flora, the presence or absence of clover, the growth stage of the crop and the time of year when treatment is necessary.

Main herbicides

Pre-emergence: asulam, ethofumesate, isoxaben, ioxynil, methabenzthiazuron.

Post-emergence, pure grass: bromoxynil, dicamba, ethofumesate, ioxynil, fluroxypyr, linuron, MCPA, mecoprop.

Post-emergence, grass/clover: benazolin, bentazone, cyanazine, 2,4-DB, dichlorprop, linuron, MCPA, MCPB, mecoprop.

ESTABLISHED GRASSLAND

***Puccinia coronata* (crown rust)**

General

Crown rust occurs on all species of *Lolium* and less frequently on other grasses. Heavy attacks reduce yield, palatability and quality of herbage as well as root development. Epidemics are seasonal and favoured by warm dry days and cool dewy nights.

Basic strategy

Control can be achieved by more frequent grazing or cutting, particularly in the autumn, and by the use of resistant cultivars. Grassland receiving adequate applications of nitrogen is usually free from severe infection. The application of fungicides is not usually necessary but will reduce losses when disease pressure is high.

Main fungicides

Sprays: propiconazole, triadimefon.

***Pyrenophora* spp. (drechslera leaf spots)**

General

Pyrenophora lolii (anamorph *Drechslera siccans*) is the commonest leaf-spotting fungus found on *Lolium* spp. A related species, *P. dictyoides* (anamorph *D. dictyoides*) also found on *Lolium*, causes a net blotch on the leaves of *Festuca pratensis*. Although commonly found, the diseases are not thought to have a major effect on yield.

Basic strategy

High levels of infection can be prevented by effective grassland management. Treatment with fungicides is rarely necessary.

Main fungicides

Sprays: propiconazole.

***Mastigosporium rubricosum* (leaf fleck)**

General

This disease can cause severe damage to *Dactylis glomerata* during cool moist weather in early spring or autumn. Symptoms consist of purplish-brown flecks; premature leaf shedding may result.

Basic strategy

Some control may be achieved by cutting or grazing affected grasslands and by the removal of infected herbage in the autumn. Adequate potassium fertilizers decrease disease incidence, while heavy nitrogen applications increase it. There are no recommendations for the use of fungicides.

***Rhynchosporium secalis* and *R. orthosporum* (leaf blotch)**

General

These pathogens cause dark brown blotches resulting in considerable damage to the leaves of *Lolium multiflorum* and *L. perenne* during cool, moist weather in spring and autumn.

Basic strategy

Cutting the grassland short early in the year and avoiding excessive use of nitrogen will help to avoid build-up of disease. In wetter more disease-prone areas, use resistant cultivars. Fungicide applications may be justified in high-risk situations.

Main fungicides

Sprays: propiconazole, triadimefon.

***Erysiphe graminis* (powdery mildew)**

General

Erysiphe graminis affects most grasses but is particularly prevalent in dense grassland of *Lolium multiflorum* with high soil nitrogen, shade and humidity. The disease forms a greyish-white powder covering on the leaves and can be particularly damaging under drought conditions.

Basic strategy

Keeping the grassland short will limit disease development. Resistant cultivars should be used for conservation crops in sheltered, highly fertile fields.

Main fungicides

Sprays: propiconazole, triadimefon, sulfur.

***Puccinia striiformis* (stripe rust)**

General

This is the most destructive rust on *Dactylis glomerata*. It forms yellow stripes on the leaves and also develops inside the glumes where it can severely affect the yield of the seed crop.

Basic strategy

Frequent cutting or grazing together with adequate nitrogen fertilizer will help to keep the disease in check. There are no fungicides recommended for this disease.

***Claviceps purpurea* (ergot)**

General

Claviceps purpurea is the most widespread and important of the diseases that attack the inflorescence. The grass seed is replaced by a black fungal sclerotium (ergot). Most grasses are affected, but the disease is particularly important in *Lolium* spp. The ergots, if eaten, will poison livestock.

Basic strategy

The disease is most common in old pastures. Where infestations have been serious, these areas should be cut before the grasses flower. When such areas are reseeded, the ground should be ploughed deeply to bury the ergots. Seed should not be taken from affected crops. There are no recommendations for chemical control.

***Monographella nivalis* (snow mould)**

General

Snow mould is important in northern regions commonly exposed to prolonged snow cover. The fungus requires at least 60 days in order to develop heavy attacks. Infected plants have bleached, water-soaked leaves which eventually die. Tillers and whole plants die within days, leading to circular dead areas and subsequent weed encroachment. Predisposing factors are stagnant humid air over turf, cool humid weather or early snow in autumn. Prolonged thick snow cover on unfrozen ground and excessive nitrogen application late in the season enhances the disease. Species of *Lolium*, *Agrostis* and *Festuca* are most susceptible.

Basic strategy

Improved drainage, reduced nitrogen applications and cutting before winter all help to limit the disease. Cold-tolerant cultivars should be grown in disease prone areas. There are no recommendations for chemical control.

***Xanthomonas translucens* pv. *graminis* (bacterial wilt)**

General

This disease affects many grass species but is particularly damaging to *Lolium multiflorum*. The disease is not always recognized, because wilt symptoms are not always evident. Affected plants fail to regrow after cutting. The disease is most severe at the heading stage and during hot summers.

Basic strategy

The bacteria are spread during mowing, younger plants being more susceptible to infection, especially when suffering from water stress. The first grass cut should not be made too early, and a clean mowing machine is advised. Excess nitrogen application can increase the severity of infection. A cultivar with a high level of resistance should be used. There are no recommendations for chemical control.

Ryegrass mosaic rymovirus

General

Lolium spp. can be extensively infected with *Ryegrass mosaic rymovirus* which is transmitted mainly by a mite, *Abacarus hystrix*, commonly found on the upper leaf surface. The virus has strains of differing virulence. The mild strain produces mottling and streaking of the leaves, while the severe strain causes a dark brown leaf necrosis. The disease affects both seed crops and grassland harvested for conservation and grazing. Infected grassland has a reduced response to nitrogen and is more prone to winter kill. *L. multiflorum* is more susceptible than *L. perenne*, and spring-sown crops more prone to infection than those sown in the autumn.

Basic strategy

Early defoliation in the autumn reduces the mite population and virus infection in the following year. Resistant cultivars are available. There are no recommendations for chemical control.

***Tipula* spp. (leatherjackets)**

General

Leatherjackets are the larvae of crane flies (*Tipula* spp.). Eggs are laid in grassland in late summer, and the hatching larvae feed during the autumn and winter, the feeding rate increasing rapidly in the spring. Attacked plants are bitten off at or just below soil level. Severe attacks on established grass may result in clearly defined patches but, in most grassland, damage is less obvious. Attacks are usually noted during the flush of spring growth, but damage is occasionally seen in early winter when leatherjacket numbers are high.

Basic strategy

Leatherjacket populations vary considerably from season to season, so routine insecticide treatment is not advised. Specific advice on the need to treat can be based on core samples taken from the grassland. Thresholds for control in well-managed lowland grass are in the order of, for example, 130-150 larvae per m² in the spring. In less intensively managed grassland, insecticide treatment is recommended if obvious leatherjacket damage is seen or where populations exceed, for example 300 per m². Control measures are usually applied at the start of grass growth in early spring. Optimum control is achieved by spraying in mild conditions, in moist soil, when larvae are active on or near the soil surface.

Main insecticides

Sprays: *Bacillus thuringiensis* var. *israelensis*, chlorpyrifos, dimethoate, etrimfos, fenitrothion, gamma-HCH, triazophos.

***Oscinella frit* (frit fly)**

General

Oscinella frit is primarily a pest of reseeded grass (see above), but it can cause damage to *Lolium* in established pastures. This usually results in the decline in the proportion of *Lolium* in a grassland or reduces the persistency of a medium-term grassland.

Basic strategy

Often, the first sign of damage is a decline in *Lolium* within the grassland but plant dissections are required to confirm this. Control of frit fly in established grassland may increase yields, but in most situations there is little economic benefit.

Main insecticides

Sprays: chlorpyrifos, cypermethrin, triazophos.

***Agriotes* spp. (wireworms)**

General

Large populations of wireworms can build up in established grassland, but severe damage to the grassland (bare patches) is rare. Birds seeking the wireworms cause further damage. Care must be taken not to confuse wireworm damage with that caused by other pests, especially bibionids.

Basic strategy

There are few effective methods of reducing wireworm populations in established grassland. A high-volume insecticide spray may reduce populations but, as soil incorporation is not possible, residual populations will continue to cause damage. Chemical control is therefore not recommended.

***Phyllopertha horticola* and *Melolontha* spp. (garden chafer, white grubs)**

General

The larvae of several chafer-beetle species are localized pests of established grassland. The most damaging is *P. horticola* which lays its eggs during the summer, the larvae feeding on grass roots in the autumn. This species has a 1-year life cycle. *M. melolontha* has a 3-year life cycle and, when fully grown, its larvae are very destructive.

Basic strategy

It is important to identify the species present. Damage caused by chafer larvae is normally obvious by early autumn when populations can be assessed by taking soil cores. More than e.g. 50 larvae of *P. horticola* per m² is likely to result in economic damage, and a high-volume insecticide spray can then be applied.

Main insecticides

Sprays: chlorpyrifos.

Aphids

General

Aphids, especially *Metopolophium festucae*, *Sitobion avenae*, *Metopolophium dirhodum* and *Rhopalosiphum padi*, can be a problem in grassland in some areas. They may cause patches of stunted growth and some may transmit virus diseases. Outbreaks cannot be predicted, but are more likely to be important in seed crops in periods of prolonged dry weather after a mild winter.

Basic strategy

Grassland should be examined closely after mild winters, and an insecticide applied if aphid numbers begin to increase rapidly. Use of certain selective insecticides (e.g. pirimicarb) will favour natural enemies.

Main insecticides

Sprays: dimethoate, pirimicarb.

***Bibio marci* and *Dilophus febrilis* (bibionids)**

General

The brown larvae of bibionid flies are sometimes mistaken for small leatherjackets, but differ in having a distinct dark head. Numbers can be very high in grassland, especially if large quantities of organic manure have been applied. Although they can feed on the roots of grasses, the main injury appears to arise from the loosening of the roots, particularly in poorly compacted soils, and they may be associated with areas of poor growth or winter kill. Birds feeding on bibionids may cause further damage.

Basic strategy

Correct identification of the larvae is essential. Bibionid larvae are difficult to control with insecticides. However, plant protection products can be applied in autumn, preferably with a high water volume or just before a rain forecast. Manure application shortly before the chemical treatment has a negative effect. Heavy organic manuring should be avoided. Some control may also be achieved with treatments applied primarily for leatherjackets.

Main insecticides

Sprays: deltamethrin, esfenvalerate, permethrin.

Weeds

General

A well managed established grassland should not have a problem with weeds. However, some management practices can give rise to weed problems. These include "poaching" (uprooting of plants by animal feeding) early or late in the season, the misapplication of manures and slurry, taking late mature hay crops, damage by heavy machinery and suboptimal applications of nitrogenous fertilizers. Typical broad-leaved weed species are *Rumex* spp. (*R. obtusifolius* and *R. crispus*), *Cirsium* spp., *Taraxacum officinale*, *Stellaria media* and poisonous weeds, such as *Senecio* spp.

Basic strategy

The basic strategy is to avoid practices that can cause the development of a weed problem by, for example, good stock management and proper application of slurry and nitrogen. When broad-leaved weeds do become a problem, a herbicide treatment may be required.

In an established grass/clover stand, where the clover needs to be preserved, the options for herbicide selection will be limited. In some cases, products harmful to clover may be applied through a height-selective applicator (ropewick). Where weed infestations are limited to small patches or isolated plants, spot application of herbicides may be practical. For effective weed control, grass and weeds should be actively growing. Typically, treatments are applied before flowering when treating primary growth and in late summer for regrowth (but before plants senesce in the autumn). Grass weeds may also be a problem (e.g. *Elymus repens*, *Poa annua*). It is difficult to control these with herbicides, and the only solution may be to plough and reseed.

Main herbicides

Clovers not important in grassland: bifenox, clopyralid, 2,4-D, dicamba, ethofumesate, fluroxypyr, linuron, MCPA, mecoprop-P, thifensulfuron-methyl, triclopyr.

Clovers important in grassland: asulam, benazolin, bentazone, MCPA, MCPB.

Herbicides applied through height-selective applicator: clopyralid, 2,4-D, glyphosate, triclopyr.

Grassland destruction

General

The aim is to destroy grass crops before reseeding or before a change to an arable crop. The treatment will eliminate grasses and provide long-term control of perennial weeds. It may be applied to a grass regrowth or before cutting for silage or hay.

Basic strategy

Grassland should be treated before cutting or grazing between June and October when 30-60 cm in height. The dose rate applied should be that which will control the least susceptible species in the grassland. Pre-harvest treatment allows maximum use of treated grass and permits the following crop to be sown within a few days after harvest or grazing.

Main herbicides

Glyphosate, glufosinate-ammonium.