Crop Profile for Lentil in Montana

Prepared: February 2002

General Production Information

LENTILS
Acreage, Yield, and Production, Montana, USA
Click Here to View a Table of Lentil Production Figures For Montana Counties

<table>
<thead>
<tr>
<th>Year</th>
<th>Acres</th>
<th>Production</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Planted (000)</td>
<td>Harvested (000)</td>
<td>Yield Per Acre Bushels</td>
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Cultural Practices

Lentils are a cool-season annual crop, classified as a grain legume or pulse. Lentils are important as a rotational crop, especially with the small cereal grains (wheat, barley), and as a cash crop. Lentils also provide the means to break the disease and weed cycle in winter cereals, conserve soil moisture relative to other rotational crops, improve soil fertility by fixing nitrogen and increase yields in the following crops. Lentils, like other spring crops in rotation with winter cereals, limit soil erosion compared to summer fallow on land that is highly erodible.

Climate conditions accompanying lentil production in northcentral, northeastern and southeastern Montana include hot dry summer days, and cool summer nights. LENTIL VARIETIES

There are two basic types of lentil, both of which are grown worldwide, and which have been developed from ancient times. They are:

- Chilean - a large-seeded type, e.g., Laird
- Persian - a smaller-seeded type, e.g., Eston

The Crop Profile/PMSP database, including this document, is supported by USDA NIFA.
Laird is a Chilean variety of lentil. It is considered by many lentil importers and consumers to be the prima donna of lentil. It is the most widely-grown variety, and is considered an extra-large seeded type. It requires 100 days to reach maturity and has some resistance to ascochyta blight. It is the tallest variety available.

Eston is a Persian variety of lentil. Eston lentil is small-seeded, matures about 10 days earlier than Laird, and out-yields Laird by about 7%. Eston lentil can be less popular because it is shorter than Laird and is more susceptible to ascochyta blight.

CDC Richlea is a medium-sized Chilean-type similar in size and color to the Chilean lentil grown in the USA. It is a high yielding variety that is susceptible to both ascochyta blight and anthracnose.

Varieties such as CDC Gold, CDC Royale, CDC Matador and Indianhead are grown in small volumes and are sold into niche markets.

The recent breakthrough in ascochyta blight resistance at the Crop Development Center in Saskatoon has led to the development of a number of new varieties destined to replace Laird, Eston and CDC Richlea. However, none of the new varieties are resistant to anthracnose. CDC Glamis is an ascochyta blight resistant large-seeded Chilean type lentil to replace Laird. CDC Glamis has out-yielded Laird in trials. It has a slightly smaller seed than Laird which may present a marketing problem in some countries.

CDC Milestone is an ascochyta blight resistant small-seeded Persian type lentil to replace Eston. CDC Milestone has out-yielded Eston in trials. Characteristics of the plant and seed are very comparable to Eston. so CDC Milestone should be well accepted in the market-place.

CDC Vantage is an ascochyta resistant medium-sized Chilean type lentil to replace CDC Richlea. It has out-yielded CDC Richlea in trials. CDC Vantage has similar seed characteristics and is slightly shorter than CDC Richlea.

CDC Redwing is a small-seeded red lentil with a pale green seed coat suitable for the red, split market. It is resistant to ascochyta blight, but susceptible to anthracnose.

Crimson is a red lentil developed in the USA at Washington State University.

Common Chilean is not a named cultivar as such, but is the designation given to seed used by early growers of lentil. It is obtained from the Palouse Area of Idaho and Washington.

Seeding and Growth Information

Lentils are slow to establish and produce limited vegetative growth and therefore sensitive to weed competition. Weed control options for lentils are limited. Selection of clean fields with histories of low weed pressure is paramount towards lessening the impacts of weeds. In planning rotations, be sure that fields are kept weed-free prior to planting lentils. Be aware of herbicide carry-over restrictions. Some
herbicides which should be avoided prior to planting lentils include Tordon, Stinger, Curtail, Amber and Ally.

**Seeding Date:** Lentil should be sown in late April or early May, when soil temperatures are above 40 degrees F. Early seeding will increase the height and size of the plant at first bloom. In most years, delayed planting after April lowers quality and seed yield. Lentils are adapted to grow during the cool season when evapotranspiration is minimal.

**Seeding Rate:** It is important to follow recommended seeding rates carefully to obtain optimum yields. Current recommended rates are:

80 to 100 lb/ac for Laird

40 to 50 lb/ac for Eston

60 to 70 lb/ac for Chilean (common)

Varieties vary in seed size. Determining variety seed weight will enable calculations of the proper seeding rate.

These seeding rates will give 12 to 14 seeds/ft\(^2\) to 6 to 7 seeds/linear ft in 6-in drill rows. The seeding density must be calibrated carefully as seed is expensive. The inoculated seed may not flow smoothly through the metering system, so the seeder should be calibrated with inoculated seed.

Lentils emerge and perform well planted in a variety of seedbeds including direct seeding into grain residue. Lentils typically are grown following winter wheat or spring barley. Cereal stubble that is fall plowed or chiseled is cultivated for weed control then harrowed and rolled.

**Seeding Depth:** The seeding depth should be 1.2 to 3 in. Proper packing after seeding is very important to make the ground smooth and even for harvest, and to prevent moisture loss. Many farmers double harrow-pack at right angles to level the surface of the field.

**Growth:** It is important that the lowest pods be as high as possible from the ground to facilitate harvest. Early seeding will normally result in higher yields. Frost on young seedlings is not a concern, as lentil seedlings can withstand considerable frost and will even grow again if the tops are frozen off. Frost on immature seeds in the fall, however, will damage the seeds and reduce crop quality.

Lentil seedlings are tolerant to frost, however they are very sensitive to wind damage. However, in both cases the lentil seedlings will emerge again from nodes beneath the surface, except under severe heat and drought conditions. A heavier seeding rate will also compensate for stand thinning from heat canker.

You may consider seeding lentil directly into standing stubble if residues are insufficient to protect the soil
Lentils start flowering after a specific number of nodes are reached and continue until drought, or nitrogen deficiency ends flowering. Maturity is reached about 100 days after emergence.

Lentil harvest begins in mid-August, with the crop being swathed and then combined. Swathing before combining will dry down the weeds and the lentil crop in instances of uneven crop maturity or heavy weed infestation. Swathing improves moisture uniformity of the lentil seed and reduces the amount of seed discoloration by weed exudates. Timely harvest of lentils is critical to avoid post maturity disease, seed bleaching and seed shatter.

### Insect Pests

Click here for a listing of Montana Section 18 and Section 24 pesticide labels

**Lygus bugs (Lygus spp.)**

Lygus bugs can be a major pest in lentil production. Hosts for these pests include weeds such as mustards and lambsquarters, and crops of alfalfa and clovers. Lygus bugs survive the winter protected in ground litter, crop residues and buildings. They may become a nuisance in households during warm winter days. Adults lay eggs in the spring and feed on various plants. Eggs hatch into nymphs in about 10 days and reach maturity in a month. It appears that only a single generation develops on lentils. Lygus bugs pierce tender leaves, stems, buds, petioles, and developing seeds.

Lygus bugs can be considered to be the most serious insect pest of lentils because feeding adults damage the seed, causing chalky spot syndrome. Seeds with chalky spot have pitted, crater-like depressions in the seed coat with or without a discolored chalky appearance. The spot causes an economic loss (market price) to the producer. Lentils with more than 3.5% chalky spot damage are graded a sample grade and their value is discounted. Yield reduction due to direct feeding and chalky spot typically ranges between 3-50%. If not treated, reductions in yield generally average about 30%.

Economic thresholds have been established for lygus bug control. When lentils are in bloom, and podding has begun, sweep nets are used to determine presence and quantity of adult
lygus bugs. If netting captures 7-10 lygus bugs per 25 sweeps, an insecticide treatment is recommended.

**Chemical control:**
Dimethoate (Dimethoate 4EC, Dimethoate 4E, Dimethoate E267) -- Dimethoate is the most effective insecticide for lygus bug control. Applied by custom applicators to 70-90% of the lentil acreage at bloom stage of lentil development. Typically applied once per year at a rate of 0.43 lbs ai/acre. PHI is 14 days. Dimethoate provides 2-3 weeks of good lygus bug control. To avoid injury to pollinating bees, applications are usually made during the early morning hours when bees are not active.

**Cultural control:**
Cultural control programs for lygus bug are only partially effective because the target insect is supported by a variety of hosts. The continuity of plant hosts support lygus bugs throughout their life cycle. Disturbing habitat by disking near fencerows and mowing road sides can potentially lower lygus bug numbers, but also will injure over-wintering populations of beneficial insects.

**Wireworms (Limonius spp.)**

Wireworm larvae usually take several years to develop. They cause little damage the first year but feed heavily thereafter, cutting off and damaging roots. Wireworm larvae feed on germinating seeds or seedling plants and will thin or destroy lentil stands. Where wireworms are suspect, growers perform soil tests to determine their population levels. Usually the presence of three or more wireworms per square foot requires control measures. Wireworm density and injury to lentils are directly related to soil moisture. Wireworms are generally low in years of average or below average precipitation, and high and damaging in years of above average precipitation.

**Chemical control:**
Lindane (Lindane 40) -- Applied as a seed treatment to about 80% of sown seed, usually in combination with fungicides. Typically applied at a rate of 0.8 fl oz ai/cwt of seed.

**APHIDS**

Pea aphid (Acyrthosiphon pisum)
Cowpea aphid (Aphis craccivora)

Aphids are considered a very serious pest of lentils. They are able to multiply quickly so a moderate infestation can become a damaging population in less than a week. Aphids injure lentils mostly by direct feeding, but are also responsible for the transmission of viruses.
Direct feeding by aphids includes sucking sap from leaves, stems, blossoms and pods. Plants heavily fed upon are stunted and produce fewer and smaller pods and seeds. Smaller plants may die from aphid feeding. Aphid predators such as the larvae of ladybugs are usually not present in high enough numbers, and typically lag behind in development of aphids. If not controlled, feeding by aphids can destroy from 25-50% of developing plants.

Chemical control:
Dimethoate (Dimethoate 4EC, Dimethoate 4E, Dimethoate E267) -- Applied by custom applicators to 70-90% of the lentil acreage at bloom stage of lentil development. Typically applied once per year at a rate of 0.43 lbs ai/acre. PHI is 14 days.

Biological control:
Natural predators are usually not present in significant numbers to reduce aphid populations below economically damaging levels.

Diseases

Seedling blight and foliar Ascochyta blight are the primary diseases of lentils grown in Montana.

Click here for a listing of Montana Section 18 and Section 24 pesticide labels

Ascochyta blight

Ascochyta blight is the most common foliar disease of lentils in the Northern Hemisphere. The fungus Ascochyta fabae f.sp.lentis causes the disease. Small brown lentils are especially susceptible to Ascochyta blight when cool, wet years cause luxuriant plant growth. The source of infection is from seed and crop residue remaining near the soil surface. The inoculum remains active in crop residue for 2-3 years, spreading rapidly by wind-driven rain and by contaminated equipment moving spores from field to field. Symptoms of infection are dark lesions along stems, leaves and pods. These lesions may girdle stems, causing upper portions of the plant to yellow, wilt and eventually die. When weather conditions favor ascochyta blight, production loss can be 10-50%, if left untreated.

Chemical control:
Thiabendazole (LSP) -- Applied as seed treatment to 20-40% of total acres, depending on year. Typically applied at the rate of 1.5 fl oz/100 cwt of seed. Control of Ascochyta blight in small brown lentils has been mainly through the use of
thiabendazole as a seed treatment. Thiabendazole does not have a federal label in Montana for lentils, but has been granted Section 18 status in the past. Without thiabendazole, the estimated production loss would range from 10 to 50%, depending upon weather conditions during the growing season.

**Cultural control:**
Sanitation practices for Ascochyta blight include having seed tested for Ascochyta blight, and planting clean seed. Since no resistant lentil varieties are available, the combination of planting disease free seed, and seed treatment has been successful in controlling most diseases of lentils and preventing the introduction of seedborne inoculum.

**Root rot and seedling blights**

The soil borne fungi Fusarium, Rhizoctonia, and Pythium cause root rot and seedling blights. These diseases are widespread in commercial lentil fields. Seedling blight from soil borne Pythium species reduces emergence and stands of lentils. Seed is infected shortly after planting, and infected seedlings fail to emerge.

**Chemical control:**

Mefenoxam (Apron XL) + fludioxonil (Maxim) -- Averaged over several years, these two seed treatments are applied in combination to about 50-70% of lentil seed. Mefenoxam is applied at the rate of 0.08 fl oz/cwt of seed, and provides excellent control of Pythium, Rhizoctonia, and Fusarium. Fludioxonil is applied at a rate of 0.04 fl oz/100 lb of seed, and provides excellent control of seedling rots, seed decays, Rhizoctonia, and Fusarium.

Captan (Captan 400) -- Captan is applied as a seed treatment to about 5-10% of the lentil seed at a rate of 1.5-2 fl oz/cwt of seed, usually as a supplement to mefenoxam and fludioxonil.

**Cultural control:**

Since soil borne diseases remain viable in the soil for several years, crop rotations with non-host crops will not eliminate the diseases. Cultivation of lentils no more frequently than every 3 years may reduce the severity of these diseases, but will not completely eliminate lentils from becoming re-infected. **Viruses**

There are at least 27 different viruses that have been identified in lentils. Of these, pea enation mosaic virus (PEMV) and bean (pea) leaf roll virus (BLRV) are two major pathogens that can cause significant damage under favorable conditions. PEMV and BLRV survive from year to year in alternate crops such alfalfa, chickpea, clover, pea, vetch and some weed species. Only BLRV can be transmitted by seed. The principle
vector is pea aphid and the green peach aphid, which can acquire the viruses after feeding on infected host plants. Flights of aphids in the spring and early summer from infected hosts spread the viruses to lentils. Symptoms of virus infection usually develop on the lentil plants in about 7 to 10 days. Symptoms of PEMV include mottling, crinkling at the top of the plant, stunting, and tissue outgrowth on pods and leaves. Pods may become distorted, and produce few or no marketable seeds. Symptoms of BLRV include chlorotic mottling in terminal foliage, which may become bright yellow in time. Stunting is frequent, and plants may die if infections occur early in the season.

The extent of damage caused by PEMV and BLRV varies from year to year and by geographical regions. Incidence of BLRV in the Pacific Northwest is not necessarily correlated with observable colonization of lentils by the pea aphid and the green peach aphid. Epidemics have occurred with only trace populations of aphids on lentils. Climatological and biological factors that trigger epidemics are not yet understood. In average years, damage is usually minimal, but about one in five years viral infections reach damaging levels and cause severe economic loss. In the 1983, PEMV and BLRV was epidemic in lentils and caused severe damage. In these instances, yields losses reached 50% in localized areas. Lentils damaged by diseases will be downgraded in market price if damaged or small in size.

Controls

Use of seed certified free of BLRV will lower the risk of introducing the virus into the field. Controlling aphids with systemic aphicides have been partially successful in reducing the field spread of viruses. Overwintering aphids feed on infected host crops and spread the virus to lentils before insecticides are applied for aphid control. Aphicides do, however, help stop the spread of secondary infection to lentils.

Resistant lentil varieties are being developed, but are not currently available for commercial release.

Weeds

Lentils are slow to establish and produce limited vegetative growth and therefore sensitive to weed competition. Grass and broadleaf weeds are a very serious problem in lentil production. Typical troublesome weeds include wild oats, various mustards, nightshades, pigweed,
common lambsquarters, prickly lettuce, pineapple weed, field pennycress and mayweed chamomile. Lentils are poor competitors against weeds and require an intensive weed control program. Weeds also contribute exudate at harvest that stains lentil seed. Stained seed is considered inferior in quality. Weeds also interfere mechanically with lentil harvest. Yield loss and reduced seed quality from weed competition, if left uncontrolled, would range between 50-100%.

Weed control options for lentils are limited. Selection of clean fields with histories of low weed pressure is paramount towards lessening the impacts of weeds. In planning rotations, be sure that fields are kept weed-free prior to planting lentils. Be aware of herbicide carry-over restrictions. Some herbicides which should be avoided prior to planting lentils include Tordon, Stinger, Curtail, Amber and Ally. **Dessicants**

Chemical desiccant use varies on a yearly basis, and depends on the extent of the weed infestation and the natural dry down of the lentil crop at maturity. Desiccant herbicides are important in years of warm wet, springs and cool, wet, summers that promote luxuriant plant growth. Under such conditions lentils will continue to flower and set pod and weeds will continue to grow as long as moisture is available. If growers must wait for natural dry down to occur under such high moisture conditions, they will risk, pod shattering, sprouting, seed coat slough, and seed bleaching. Weeds that remain luxuriant under available moisture will also mechanically impair the harvest of the crop. In years when weeds are less threatening, lentils are mechanically swathed or direct combined.

**Herbicide Profiles - Lentils**

[Click here for a listing of Montana Section 18 and Section 24 pesticide labels]

**Dual II Magnum**  
s-metolachlor **Rate:** 1 to 2 pints product/acre  
**Timing:** Preplant incorporated (PPI). Apply within 14 days before planting, and incorporate into the top 2 inches of soil. May also be applied as a preemergence surface treatment, before crop and weeds emerge.  
**Remarks:** Controls certain annual grasses and some annual broadleaf weeds in dry beans. Surface application requires rainfall or irrigation to activate. Rates depend on soil texture and organic matter. Use preplant incorporated treatment for furrow irrigation.  
**Precautions:** Injury may occur under abnormally high soil moisture conditions during early development of the crop. Do not feed or graze livestock on crop residue. Read the label for crop rotation restrictions

**FarGo (10G,4EC)**  
triaillate **Rate:** 1.25 quarts/A or 12.5 to 15.0 lbs granules/acre.  
**Timing:** Apply preplant or postplant incorporate.  
**Remarks:** Preplant incorporate with a field cultivator set 3 to 4 inches deep and follow with a second, more shallow incorporation. Controls wild oats.
**Precautions:** Do not graze treated areas.

**Frontier (6EC)**

dimethenamid **Rate:** 20 to 32 oz. Frontier 6EC/acre  
**Timing:** Preplant (surface or shallow incorporated), preemergence, or early post emergence (1st to 3rd trifoliate stage).  
**Remarks:** Controls annual grasses and small-seeded broadleaf weeds in lentils. Good activity on nightshades. Broader weed control spectrum with tank mixes or sequential treatment using other posemergence herbicides. See label for approved tank mixes.  
**Precautions:** To prevent crop injury, this product is not recommended as a preplant treatment on coarse texture soils with low organic matter or low cation-exchange-capacity (CEC). Post emergence treatment must be delayed until first trifoliate leaf is fully expanded. Allow at least 70 days between application and harvest. Verify with local seed supplier the selectivity of Frontier on your specific lentil variety.

**Prowl (3.3 EC)**

pendimethalin **Rate:** 1.2 to 3.6 pints/acre  
**Timing:** Preplant incorporated (PPI)  
**Remarks:** Apply any time within 60 days prior to planting. Thoroughly mix the previous crop residues into the soil to a depth of 4 to 6 inches by plowing or disking prior to application. Refer to the Prowl label for incorporation instructions.  
**Precautions:** Do not apply preemergence. Avoid post-plant tillage that will bring untreated soil to the surface. Do not apply more than once during the cropping season. Do not apply to lentil forage grown for livestock feed.

**Pursuit W (2AS) (70DG)**

imazethapyr **Rate:** 3 oz./acre for 2AS; 1.10 oz/acre for 70 DG  
**Timing:** Apply broadcast with shallow incorporation within 1 week before planting. Do not incorporate greater than 3 inches. Pursuit can also be applied after planting but before crop emergence.  
**Remarks:** Controls wild buckwheat, kochia, wild mustard, redroot pigweed, shepherdspurse, and Russian thistle. Plant lentils at least 1 to 2 inches deep to reduce risk of crop injury. Incorporation following application will decrease the likelihood of injury.  
**Precautions:** Pre-slurry DG formulation in water if applying in liquid fertilizer suspensions. Do not apply if cold and/or wet conditions are present or expected within 1 week of application. Injury potential greatest on sandy soils. Allow at least 60 days between application of Pursuit and harvest. Sensitive crops such as sugarbeets, mint, canola, and leafy vegetables may be injured by not planning a crop rotation program for the years following Pursuit application.

**Roundup Ultra**

**Roundup Ultra RT**
glyphosate **Rate:** Broadcast - 1 quart in 3 to 20 gallons per acre (GPA)  
**Spot Treatment** - 2 to 3 quarts in 10 to 20 GPA or as a 2% solution.
**Timing:** Consult label on timing for broadcast and spot treatments. Click here to access label.

**Remarks:** Section 24C for Montana. Preharvest broadcast and spot treatment for weeds. **Precautions:** Avoid contact with foliage, green stems, exposed non-woody roots or fruit of crops. Severe injury or destruction may result.

**Sencor (75DF, 4F)**
metribuzin **Rate:** For 4F apply 0.5 to 0.75 pints/acre. For 75DF apply 0.33 to 0.5 lbs/acre
**Timing:** Apply preemergence only. Apply after seeding but before the lentils germinate.
**Remarks:** Sencor may be incorporated to a depth of 1 to 2 inches if the soil is dry. If moisture is present or expected, a preemergence treatment is best. Control several broadleaf weeds including lambsquarters, pigweed and mustards.
**Precautions:** Do not use on coarse-textured soils with less than 1.5% organic matter. Do not apply on very moist soils or wet crop foliage. Do not apply on lentils seeded less than 2 inches deep. Crop injury may occur if lentils are under stress conditions caused by cool weather, low fertility, disease, or insect damage

**Postemergent Assure II (0.88 EC)**
quizalofop **Rate:** 6 to 12 oz./acre
**Timing:** Apply to emerged weedy grasses or volunteer grains within height ranges specified on the label (between 2 and 10 inches tall, depending on species). For best results, apply when grasses are in the 3-leaf to pre-boot stage.
**Remarks:** For control of emerged annual grass weeds, volunteer cereals, and quackgrass in lentils. Approved for ground applications. Always include a nonphytotoxic petroleum based crop oil concentrate or a nonionic surfactant. Rate is dependent on weed species, size, and density. Use high label rates on larger weeds and higher populations. Subsequent flushes of grasses require additional treatment.
**Precautions:** Reduction in grass control is possible when Assure II is applied immediately before or after a postemergence broadleaf herbicide. Wait at least 24 hours after applying Assure before applying a broadleaf herbicide. In fields already treated with broadleaf herbicide, wait generally 7 days before applying Assure. Do not mix with any pesticide or any adjuvant not listed on the label. Do not apply within 60 days of harvest. Do not apply through any irrigation system. Do not apply more than 14 oz. per acre per season. Do not feed vines or hay.

**Poast (1.5 EC)**
sethoxydim **Rate:** 1 to 2.5 pints/acre
**Timing:** Apply to actively growing grasses when they are at the proper stage specified on the product label.
**Remarks:** Rate depends on weed size and species. Add 2 pints/acre of a nonphytotoxic crop oil concentrate or a methylated seed oil at 1.5 pints/acre to improve penetration into leaves. Control may be erratic when grasses are stressed from lack of vigor, drought, or high temperatures.
Precautions: Do not cultivate within 5 days prior to or 7 days after application. Do not apply within 50 days of harvest. Do not apply more than 4 pints/acre in one season. Do not apply if rainfall is expected within one hour following application.

Sencor (75DF, 4F)
metribuzin Rate: For 4F apply 0.5 to 0.75 pints/acre;
For 75 DF apply 0.33 to 0.5 lbs/acre
Timing: Postemergence: Apply when weeds are less than 2 inches tall and before the lentils are 6 inches in height.
Remarks: Controls several broadleaf weeds including lambsquarter, pigweed, and mustards. For suppression of dog fennel, use 0.25 lbs/acre.
Precautions: Do not use on coarse-textured soils with less than 1.5% organic matter. Do not apply on very moist soils or wet crop foliage. Do not apply on lentils seeded less than 2 inches deep. Do not apply within 75 days of harvest. Do not apply postemergence within 3 days of cool, wet, cloudy weather. Crop injury may occur if lentils are under stress conditions caused by cool weather, low fertility, disease, or insect damage

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### Perennial Grasses

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### Annual Broadleaf Weeds

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<td>Chickweed, common</td>
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<td>Dog fennel</td>
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<td>Henbit</td>
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<td>-</td>
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<tr>
<td>Lambsquarters, common</td>
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<td>X</td>
<td>X²</td>
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<tr>
<td>Mustard, wild</td>
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<td>Nightshade, spp</td>
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<tr>
<td>Pennycress, field</td>
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<td>Pigweed, redroot</td>
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<td>Purslane</td>
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<tr>
<td>Shepherdspurse</td>
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<td>-</td>
<td>P</td>
<td>X</td>
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<td>Spurge, prostrate</td>
<td>-</td>
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<tr>
<td>Thistle, Russian</td>
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</tbody>
</table>
X = Control,  S = Seedling control only,  P = Partial control,  - weed not listed
Level of control considered acceptable for inclusion of a weed on labels may vary among
herbicide manufacturers. Absence of a weed from a label does not mean complete lack of
control. High label rates, or repeated applications may be necessary to achieve level of
control claimed for some weeds

1 = Non-ALS/AHAS resistant biotypes
2 = Pre Plant Incorporate only

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**Contacts**

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**References**

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