Chemical Weed Control in Small Grains and Forages 1978

Cooperative Extension South Dakota State University

Follow this and additional works at: https://openprairie.sdstate.edu/extension_fact

Recommended Citation
https://openprairie.sdstate.edu/extension_fact/313

This Fact Sheet is brought to you for free and open access by the SDSU Extension at Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in SDSU Extension Fact Sheets by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact michael.biondo@sdstate.edu.
Chemical Weed Control in Small Grains and Forages 1978

COOPERATIVE EXTENSION SERVICE
SOUTH DAKOTA STATE UNIVERSITY
U.S. DEPARTMENT OF AGRICULTURE
Chemical Weed Control
in Small Grains and Forages 1978

By Leon J. Wrage, Extension agronomist-weeds and
W. E. Arnold, associate professor, plant science

Chemical weed control is a valuable supplement to and not a
replacement for such sound management practices as using
clean seed, proper seedbed preparation, good rotations, timely
cultivation and crop competition.

Information in this publication is based on research by the
South Dakota Agriculture Experiment Station and other re­
search or observations. Herbicides are included only after the
chemical is registered by the Environmental Protection Agency
(EPA) as to residue tolerances in crops used for food or feed.

FOLLOW THE LABEL

Federal regulations make it unlawful for any per­
son to use an herbicide in a manner inconsistent with
its labeling. This includes the kind of crop and weed;
rate, carrier and other application directions; stor­
age, disposal and protective clothing; or other pre­
cautions stated.

Information in this fact sheet is designed to provide a sum­
mary of herbicide uses and does not imply a guarantee or
responsibility for results. Information needed to secure the
maximum benefits from the tables is listed below:

1. Weeds are classified as broadleaved weeds (includes the
more common weeds such as lambsquarters, pigweed, and
kochia) and weedy grasses (includes green and yellow fox­
tail). A few special weeds are listed individually.
2. Chemical uses suggested are based on the actual chemical
(active ingredient or acid equivalent) in each herbicide. The
common and trade names of most chemicals are listed. Pro­
duct formulation is listed with the trade name. Trade names
for chemicals such as 2,4-D or MCPA are too numerous to
list. The label for specific products may vary as to crop, rate,
application directions, etc. Check the label of the product to
be used. Herbicides shown in Table 1 are rated as to relative
effectiveness on several weed species and crop tolerance.

3. The amount of actual and the amount of product per acre are
listed for most treatments. The amount of product is not
given for those treatments having numerous trade names or
formulations. The rates listed have been satisfactory in field
research tests and are the maximum rates for most situations.
It is important to read the product label for detailed informa­
tion on rates to use for that product. The amount of 2,4-D or
MCPA usually required to control several weeds at different
growth stages is shown in Table 2. Use only enough chemical
control the weed.

Do not tank-mix herbicides unless the label includes direc­
tions. Additives such as surfactants or fertilizer are not rec­
commended except as listed for individual treatments.

4. Time to spray is given for all chemicals with respect to the
crop, unless otherwise stated.
Preplant—treatments made before the crop is planted and
usually incorporated with a harrow or disk.
Preemergence—treatments made after planting, but before
emergence of the crop and weeds.
Post-emergence—treatments made after emergence of
weeds. Apply post-emergence treatments as early as possible
for two reasons: (1) the weeds are easier to kill when young,
and (2) the weeds are competing with the crops for moisture
and nutrients. The most desirable time for spraying both
crops and weeds is relatively short.

5. For detailed information about herbicide application and
other methods of weed control, obtain fact sheets from this
list.

OTHER WEED CONTROL PUBLICATIONS

(Available through your county Extension agent or the
Bulletin Room, South Dakota State University,
Brookings, 57006)

- Weed Control in Small Grain - Weed Control in Lawns
Chemical Weed Control in:
- Corn - Soybeans - Sorghum - Sunflowers
- Trees - Pasture, Range and Hayland
Control and Elimination of:
- Noxious Weeds - Wild Oats - Russian Knapweed
- Leafy Spurge - Field Bindweed - Quackgrass
- Thistles - Wormwood Sage - Checking Weed Sprayers

Table 1 gives a general rating of weed control and crop
tolerance with recommended rates used under field conditions.
The ratings are based on plot data and other observations.
Weed control and crop tolerance may vary with growing condi­
tions, the rate used and the stage of growth. A weed control
rating of '1' is assigned those treatments which gave the best
tolerance of the weed. Perennial control refers to top-growth
suppression. Under field conditions with mixed weed popula­
tions, the best choice is often a combination of some chemicals
listed. For some weeds, combination treatments may give bet­
ter control than either herbicide used alone.

Table 1 Weed Control Rating and Crop Tolerance
Small Grain and Flax Herbicides

<table>
<thead>
<tr>
<th>Weed Control</th>
<th>Crop Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>Herbs</td>
</tr>
<tr>
<td>1 = excellent</td>
<td>2 = good</td>
</tr>
<tr>
<td>2 = fair</td>
<td>4 = poor</td>
</tr>
</tbody>
</table>

Other Methods of Weed Control

- Leafy Spurge
- Field Bindweed
- Quackgrass
- Thistles
- Wormwood Sage
- Checking Weed Sprayers

Small Grain and Flax Herbicides

- Small Grains and Forages
- Weed Control
- Chemical Weed Control
- Weed Control Rating and Crop Tolerance
### ESTABLISHED LEGUMES (Note "remarks" for specific crop)

<table>
<thead>
<tr>
<th>Weeds</th>
<th>Common name</th>
<th>Rate lb/A actual*</th>
<th>Trade name-formulation</th>
<th>Rate/A product</th>
<th>Time to Spray and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerous broadleaved and grassy annuals</td>
<td>simazine</td>
<td>1-1½</td>
<td>Princep-80% wp</td>
<td>1¼-1 4/5 lb</td>
<td>Apply before weed emergence after last cutting in fall and before soil freezes. For alfalfa. Use only on alfalfa established for at least 1 year. Do not use on sandy soils. Do not graze treated areas for 30 days or cut for hay for 60 days after treatment.</td>
</tr>
<tr>
<td></td>
<td>terbacil</td>
<td>.4-1.2</td>
<td>Sinbar-80% wp</td>
<td>½-1½ lb</td>
<td>Apply in the fall after last cutting or in the spring before new growth starts. For established pure alfalfa stands only. Use the lower rates on light soils. Do not use on sandy soil. Do not replant treated areas to any crop for 2 years after application.</td>
</tr>
<tr>
<td>Broadleaved</td>
<td>2,4-DB amine</td>
<td>½-2</td>
<td>Butyrac or Butoxone</td>
<td></td>
<td>Apply when annual weeds are 2-3 inches tall or perennials are 6-8 inches tall. For established legumes. Do not use more than ¾ lb/A on red clover. Do not graze or harvest for livestock feed within 30 days after application.</td>
</tr>
<tr>
<td></td>
<td>2,4-DB ester</td>
<td>½-1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### LEGUME SEEDINGS (without companion crop)

**alfalfa, birdsfoot trefoil, red clover, alsike clover**

<table>
<thead>
<tr>
<th>Weeds</th>
<th>Common name</th>
<th>Rate lb/A actual*</th>
<th>Trade name-formulation</th>
<th>Rate/A product</th>
<th>Time to Spray and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annuals</td>
<td>EPTC</td>
<td>2-3</td>
<td>Eptam-7# gal</td>
<td>2½-3½ pt</td>
<td>Preplant incorporated. Apply to smooth soil surface and incorporate immediately with a tandem disk set to cut 5-6 inches deep.</td>
</tr>
<tr>
<td></td>
<td>benzin</td>
<td>1½-1½</td>
<td>Balan-1½# gal</td>
<td>¾-1 gal</td>
<td>Preplant incorporated. Incorporate as for EPTC above.</td>
</tr>
<tr>
<td>Kochia</td>
<td>2,4-DB amine</td>
<td>½-1</td>
<td>Butyrac or Butoxone</td>
<td></td>
<td>Apply when legume is over 2 inches tall and weeds less than 3 inches. Do not graze or harvest for feed at least 60 days after treatment. Do not use over ¾ lb on red clover. Do not use on sweet clover. Higher rates will kill tops of Canada thistle and field bindweed.</td>
</tr>
<tr>
<td>Russian thistle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lambsquarters</td>
<td>2,4-DB ester</td>
<td>½-3¼</td>
<td>Butoxone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pigweed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mustards</td>
<td>2,4-DB amine</td>
<td>1-1½</td>
<td>Butyrac or Butoxone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pigweed</td>
<td>2,4-DB ester</td>
<td>¾-1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SMALL GRAINS (underseeded to legumes)

<table>
<thead>
<tr>
<th>Weeds</th>
<th>Common name</th>
<th>Rate lb/A actual*</th>
<th>Trade name-formulation</th>
<th>Rate/A product</th>
<th>Time to Spray and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lambsquarters, mustard, ragweed, pigweed</td>
<td>MCPA amine</td>
<td>¼</td>
<td>Numerous</td>
<td></td>
<td>Companion crop tillered to boot and legume seedlings 2-3 inches tall. Emergency treatment where weeds are heavy. Crop and/or weed canopy reduces risk of legume injury. Check product label.</td>
</tr>
</tbody>
</table>
### FLAX

<table>
<thead>
<tr>
<th>Weeds</th>
<th>Common name</th>
<th>Rate lb/A actual *</th>
<th>Trade name-formulation</th>
<th>Rate/A product</th>
<th>Time to Spray and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some broadleaved</td>
<td>MCPA ester</td>
<td>$\frac{1}{4}$</td>
<td>Numerous</td>
<td></td>
<td>Apply when flax is 2-6 inches tall but before buds form. Treat before weeds are 4 inches tall. May be underseeded to legumes. More risk of injury with higher rates.</td>
</tr>
<tr>
<td></td>
<td>MCPA amine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foxtails</td>
<td>dalapon</td>
<td>$\frac{3}{4}$</td>
<td>Dowpon-74% a.e.</td>
<td>1 lb</td>
<td>Apply when flax is 1-6 inches tall and weeds are less than 2 inches tall. Tank mix dalapon with MCPA amine recommendation above to control annual grasses and broadleaved annual weeds. Do not use on flax underseeded to legumes. Marginal crop tolerance, especially under drought stress.</td>
</tr>
<tr>
<td>Barnyardgrass</td>
<td></td>
<td></td>
<td>Basifapon-74% a.e.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild oats</td>
<td>diallate</td>
<td>1½</td>
<td>Avadex-4#/gal</td>
<td>1½ qt</td>
<td>Preplant or preemergence. Apply to smooth soil surface and incorporate into soil no deeper than 2 inches immediately after treatment. May be underseeded to legumes. Do not graze unharvested crop.</td>
</tr>
<tr>
<td>barban</td>
<td></td>
<td>$\frac{1}{4}$-$\frac{3}{8}$</td>
<td>Carbyne-1#/gal</td>
<td>$\frac{1}{4}$-$\frac{3}{8}$ gal</td>
<td></td>
</tr>
<tr>
<td>Wild buckwheat</td>
<td>bromoxynil</td>
<td>$\frac{1}{4}$</td>
<td>Buctril-2#/gal</td>
<td>1 pt</td>
<td>Apply when flax is 2-8 inches tall and weeds are not beyond the 3- to 4-leaf stage. Do not apply in bud stage or in humid weather or when temperature is over 85 degrees F. Not labeled for use in combination with other herbicides. Do not use on flax underseeded to legumes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brominal-2#/gal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual grass Some broadleaved</td>
<td>EPTC</td>
<td>3</td>
<td>Eptam-7#/gal</td>
<td>3½ pt</td>
<td>Preplant incorporated. Incorporate immediately with a tandem disk set to cut 5-6 inches deep. Crop searing or occasional stand reduction at emergence does not normally reduce yields.</td>
</tr>
</tbody>
</table>

### GRASSES

<table>
<thead>
<tr>
<th>Weeds</th>
<th>Common name</th>
<th>Rate lb/A actual *</th>
<th>Trade name-formulation</th>
<th>Rate/A product</th>
<th>Time to Spray and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaved</td>
<td>2,4-D</td>
<td>$\frac{1}{2}$-$\frac{3}{4}$</td>
<td>Numerous</td>
<td></td>
<td>Apply after 4-leaf stage of grass seedlings. Do not graze dairy animals on treated area within 7 days after 2,4-D application. Some labels recently reviewed by EPA may be more restrictive. Palatability of poisonous plants may be increased after spraying. Keep livestock off treated area with poisonous plants for 3 weeks. Use lower rates on warm-season grass seedlings.</td>
</tr>
<tr>
<td></td>
<td>MCPA</td>
<td></td>
<td></td>
<td></td>
<td>Establishes stands, any time (except heading for seed fields). Best weed control in June. Use ester formulations for woody and brushy plant control. Do not graze dairy animals on treated area within 7 days after 2,4-D application. Some labels recently reviewed by EPA may be more restrictive. Palatability of poisonous plants may be increased after spraying. Keep livestock off treated area with known poisonous plants for 3 weeks. Do not harvest hay from treated areas or graze for 7 months after application.</td>
</tr>
<tr>
<td>2,4-D Silvex</td>
<td>$\frac{3}{4}$-2</td>
<td></td>
<td>Numerous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual bromes atrazine</td>
<td>atrazine-80 up</td>
<td>1-1½ lb</td>
<td>AAAtrex-4#/gal</td>
<td>1.6-2 pt</td>
<td>Fall application. Do not use on bluegrass, crested wheatgrass, or intermediate wheatgrass. Do not harvest hay from treated areas or graze for 7 months after application.</td>
</tr>
</tbody>
</table>
### OATS (not underseeded to legumes)

<table>
<thead>
<tr>
<th>Weeds</th>
<th>Common name</th>
<th>Rate lb/A actual</th>
<th>Trade name/formulation</th>
<th>Rate/A product</th>
<th>Time to Spray and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaved</td>
<td>MCPA ester$</td>
<td>1/2</td>
<td>Numerous</td>
<td>—</td>
<td>Apply 3- to 4-leaf or early boot stage. Oat varieties differ in the degree of susceptibility to 2,4-D. See fact sheet “Weed Control in Small Grain.” Do not graze or feed forage from treated fields within 2 weeks after treatment. After the dough stage, 1 lb/A may be used. With this late application, do not use treated straw for livestock feed.</td>
</tr>
<tr>
<td></td>
<td>2,4-D amine</td>
<td>1/2</td>
<td>Numerous</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MCPA amine$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild buckwheat</td>
<td>dicamba</td>
<td>1/8</td>
<td>Banvel-4#/gal</td>
<td>1/4 pt</td>
<td>Apply at 2- through 4-leaf stage. Mix with 1/4 lb/A MCPA amine to improve control of other broadleaved weeds. Marginal crop tolerance. Do not apply after the 4-leaf stage. Do not graze or harvest for dairy feed prior to crop maturity.</td>
</tr>
<tr>
<td></td>
<td>bromoxynil</td>
<td>1/4-3/8</td>
<td>Brominal-2#/gal</td>
<td>1-1 1/2 pt</td>
<td>Apply at 2-leaf to early boot stage before weeds are beyond the 3- to 4-leaf stage. Mix 1/4 lb/A MCPA with Brominal to improve control of other broadleaved weeds. Apply mixture at 3- to 4-leaf stage. Do not graze for 30 days after treatment.</td>
</tr>
</tbody>
</table>

### WINTER WHEAT AND RYE

<table>
<thead>
<tr>
<th>Weeds</th>
<th>Common name</th>
<th>Rate lb/A actual</th>
<th>Trade name/formulation</th>
<th>Rate/A product</th>
<th>Time to Spray and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaved</td>
<td>2,4-D ester</td>
<td>1/2</td>
<td>Numerous</td>
<td>—</td>
<td>Apply in spring, when crop fully stooled until boot stage. Do not graze or feed forage from treated fields within 2 weeks after treatment. After the dough stage, 1 lb/A may be used. With this late application, do not use treated straw for livestock feed.</td>
</tr>
<tr>
<td></td>
<td>2,4-D amine</td>
<td>3/4</td>
<td>Numerous</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Wild buckwheat</td>
<td>bromoxynil</td>
<td>1/4-3/8</td>
<td>Brominal-2#/gal</td>
<td>1-1 1/2 pt</td>
<td>Apply in spring, 2-leaf to early boot—winter wheat only. Mix 1/4 lb/A MCPA or 2,4-D ester with Brominal to improve control of other broadleaved weeds. Commercial premixes (2 lb bromoxynil and 2 lb MCPA ester per gal) are available as Brominal Plus or Bronate. Do not graze for 30 days after treatment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Buctril-2#/gal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild oats</td>
<td>difenzoquat</td>
<td>2 1/2-4</td>
<td>Avenge-2#/gal</td>
<td>2 1/2-4 pt</td>
<td>Apply in the spring when the weed is in the 3- to 5-leaf stage. Use the high rate for heavy infestations of more than 25 plants/square foot. Best results under good growing conditions. May be tank-mixed with MCPA amine or bromoxynil. Minimum amount of water is 3 gal/A for aerial and 10 gal/A for ground. Do not graze or harvest treated fields for forage. Has not been tested in South Dakota.</td>
</tr>
</tbody>
</table>

---

*Acid equivalent or active ingredient

†Treatment at this stage will not remove competition early enough to improve crop yield; however, it may prevent weed seed production and facilitate harvesting operations.

§MCPA is not so apt to injure the crop; however, it is less effective as a weed killer, except MCPA is equally effective on Canada thistle, lambsquarters, and mustards.
### SPRING WHEAT AND BARLEY (not underseeded to legumes)

<table>
<thead>
<tr>
<th>Weeds</th>
<th>Common name</th>
<th>Rate lb/A actual</th>
<th>Trade name - formulation</th>
<th>Rate/A product</th>
<th>Time to Spray and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaved</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,4-D ester</td>
<td></td>
<td>1/2</td>
<td>Numerous</td>
<td></td>
<td>Apply at 5-leaf to early boot stage. Do not graze or feed forage from treated fields within 2 weeks after treatment. After the dough stage, 1 lb/A may be used. With this late application, do not use treated straw for livestock feed.</td>
</tr>
<tr>
<td>2,4-D amine</td>
<td></td>
<td>3/4</td>
<td>Numerous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCPA ester§</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCPA amine§</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild oats</td>
<td>triallate</td>
<td>1 (wheat)</td>
<td>Far-go-4 #/gal</td>
<td>1 qt (wheat)</td>
<td>Preplant or preemergence. Use preemergence on wheat. Apply to a smooth surface and incorporate into soil no deeper than 2 inches immediately after treatment. Do not graze livestock on treated areas.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1¼ (barley)</td>
<td></td>
<td>1¼ qt (barley)</td>
<td></td>
</tr>
<tr>
<td>barban</td>
<td></td>
<td>1/4-½</td>
<td>Carbyne-1 #/gal</td>
<td>1/4-½ gal</td>
<td>Apply when weed is in the 2-leaf stage, before 4-leaf stage of crop, and not more than 14 days after crop emergence. Do not allow livestock to graze treated fields until after crop is harvested.</td>
</tr>
<tr>
<td>difenzoquat</td>
<td>(barley only)</td>
<td>2/3-1</td>
<td>Avenge-2 #/gal</td>
<td>2¼-4 pt</td>
<td>Apply when the weed is in 3- to 5-leaf stage. Do not use on spring wheat in South Dakota. Use the high rate for heavy infestations of more than 25 plants/square foot. Best results under good growing conditions. Crop damage possible under stress conditions. May be tank-mixed with MCPA amine or bromoxynil. Minimum amount of carrier is 3 gal/A for aerial and 10 gal/A for ground. Do not graze or harvest treated fields for forage.</td>
</tr>
<tr>
<td>Wild buckwheat</td>
<td>dicamba</td>
<td>1/8</td>
<td>Banvel-4 #/gal</td>
<td>¼ pt</td>
<td>Apply at the 2- through 4-leaf stage. Do not use on barley. Mix with 1/4 lb/A 2,4-D or MCPA amine to improve control of other broadleaved weeds. A commercial premix (1 1/4 lb dicamba and 2 1/2 lb MCPA amine per gal) is available as MonDak. Apply mixture at the 4-leaf crop stage. Do not graze for dairy feed prior to crop maturity.</td>
</tr>
<tr>
<td></td>
<td>(wheat only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/4-½</td>
<td>Brominal-2 #/gal</td>
<td>1-1½ pt</td>
<td>Apply at 2-leaf to early boot stage. Mix 1/4 lb/A MCPA or 2,4-D ester with Brominal to improve control of other broadleaved weeds. Commercial premixes (2 lb bromoxynil and 2 lb MCPA ester per gal) are available as Brominal Plus or bronze. Apply mixture at the 5-leaf to early boot stage. Do not graze for 30 days after treatment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Buctril-2 #/gal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Acid equivalent or active ingredient

†Treatment at this stage will not remove competition early enough to improve crop yield; however, it may prevent weed seed production and facilitate harvesting operations.

§MCPA is not so apt to injure the crop; however, it is less effective as a weed killer, except MCPA is equally effective on Canada thistle, lambsquarters, and mustards.
### Table 2 AMOUNT OF CHEMICAL FOR WEEDS

The amount of 2,4-D or MCPA usually required to control several weeds at different growth stages is listed below. The same amount of chemical is less effective as the weed matures. Control may vary due to growing conditions and the chemical or formulation. Rates shown cannot be used in all crops. Refer to the section for each crop and the product label.

<table>
<thead>
<tr>
<th>¼ lb/A</th>
<th>½ lb/A</th>
<th>¾ lb/A</th>
<th>1 lb/A or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ragweeds, 2-4 in.</td>
<td>Ragweeds, over 4 in.</td>
<td>Ragweeds, over 4 in.</td>
<td>Canada thistle</td>
</tr>
<tr>
<td>Pennycress, 2-4 in.</td>
<td>Pennycress, over 4 in.</td>
<td>Pennycress, over 4 in.</td>
<td>Dandelion</td>
</tr>
<tr>
<td>Pigweeds, 2-4 in.</td>
<td>Pigweeds, over 4 in.</td>
<td>Pigweeds, over 4 in.</td>
<td>Field bindweed</td>
</tr>
<tr>
<td>Mustard, 4-6 in.</td>
<td>Mustard, over 6 in.</td>
<td>Mustard, over 6 in.</td>
<td>Field bindweed</td>
</tr>
<tr>
<td>Lambsquarters, 4-6 in.</td>
<td>Lambsquarters, over 6 in.</td>
<td>Lambsquarters, over 6 in.</td>
<td>Perennial sowthistle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flodman thistle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bull thistle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Burdock (early)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kochia, 2-4 in.</td>
<td>Cinquefoil</td>
<td>Gumweed, 6-12 in.</td>
<td>Blue lettuce</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mare's tail</td>
<td>Yarrow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Puncture vine</td>
<td>Goldenrod</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plantains</td>
<td>Hoary cress</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Leafy spurge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Russian knapweed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sand sagebrush</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vervain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Toadflax</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Water hemlock*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fringe sage*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Buckbrush*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bur ragweed*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Big sagebrush*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wild rose*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Willows*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Musk thistle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocklebur, over 6 in.</td>
<td>Cocklebur, over 6 in.</td>
<td>Cocklebur, over 6 in.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sowthistle, annual, over 6 in.</td>
<td>Sowthistle, annual, over 6 in.</td>
<td>Sowthistle, annual, over 6 in.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunflower, 2-6 in.</td>
<td>Sunflower, over 6 in.</td>
<td>Sunflower, over 6 in.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ladysthumb, 2-6 in.</td>
<td>Ladysthumb, over 6 in.</td>
<td>Ladysthumb, over 6 in.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Velvet leaf, 4-6 in.</td>
<td>Velvet leaf, over 6 in.</td>
<td>Velvet leaf, over 6 in.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild lettuce, 4-6 in.</td>
<td>Wild lettuce, over 6 in.</td>
<td>Wild lettuce, over 6 in.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russian thistle, 2-4 in.</td>
<td>Russian thistle, 4-6 in.</td>
<td>Russian thistle, 4-6 in.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild buckwheat, 2 leaves</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morningglory, annual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peppergrass, annual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* These weeds require at least 2 lbs acid equivalent per acre.

---

*Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the USDA. Hollis D. Hall, Director of Cooperative Extension Service, South Dakota State University, Brookings. Educational programs and materials offered without regard to age, race, color, religion, sex, handicap or national origin. An Equal Opportunity Employer.*