Serious weed management issues in pastures are a symptom of a problem with the crop or site. These problems can include grazing methods, fertilization programs, forage species selection, and irrigation or water management.

Land used for grazing livestock will not warrant the major expense required for herbicide use or other methods to control weeds, in many scenarios. It is usually more appropriate to look for ways to manage the forage and the site to prevent or reduce weed problems. Changing the grazing methods, fertilization, forage species, and water management will change the competitive balance in favor of the forage rather than the weeds, in many cases.

Healthy and well-established forage plants are more likely to resist weed invasions. Therefore, manage desirable forage species to make them as competitive as possible with weeds. The areas around gates, water troughs, feed bunks, bedding grounds, roadways, and fence lines should be the first to receive attention, because forage plants are sparse there and the soil is disturbed frequently. Weeds often first become established in these spots; then, it is much easier for them to spread out to grazing land. It is not practical to completely stop disturbing the soil, but reseeding a competitive grass can make the sites much less inviting to weed invasion. If it is not practical or economical to overseed an entire pasture, consider seeding livestock trails and reseeding both sides of roadways, since this is where weeds are likely to show up first.

Pastures can be made more competitive against weeds by taking reasonable measures to promote the forage. This is crop management, not weed management. Controlling weeds does not necessarily mean an increase in forage yield. As a general rule, every unit of weeds produced reduces forage by an equivalent amount. If available resources are used to make the crop grow better, a yield increase can be expected, and the impact of weeds should be reduced. It is important to carefully select the forage species and variety for the site and the objectives. Then fertility, soil pH, irrigation or drainage, grazing management, mowing, and periodic overseeding all have potential to influence crop growth and the ability of the forage to compete with weeds.

When forage deteriorates to the point that corrective measures must be taken, the question is how to best correct the situation. If tillage is feasible, it is tempting to start over by plowing or disking, to prepare a new seedbed for a pasture. This may be the best alternative, but more often it exposes many new weed seeds to an environment that favors their germination. The land is out of forage production for several months, and nothing has been done to prevent further deterioration under this management scenario. Increased soil erosion and the relatively high cost are additional disadvantages of complete pasture renovation.

It may be better to simply overseed the pasture by the most suitable method. Several types of no-till planters and techniques may be appropriate. If the seed is simply broadcast on the soil surface it will help to irrigate, run livestock over the field for a few days, or harrow and then pack or roll the field to move the seed into contact with the soil. Broadcast seeding spreads the forage seed over the entire pasture area, which should be more competitive with the weeds than drilling in rows. However, no-till planting in rows offers the obvious advantages of not taking the field out of production for a long period, and creating little soil disturbance that would expose new weed seeds to conditions that favor their germination. Increasing the seeding rate of the forage by approximately 30% is recommended when using the broadcast method.

In areas inaccessible to machinery, it may be appropriate to feed seeds of desirable species to the livestock so the seed will be planted after passing through the animals. Certain grasses and most small-seeded legumes remain viable after going through an animal’s digestive system.

There are times when direct action to manage weeds is advisable. Some examples of these situations are provided below.

1. Weeds that are new to a farm or property and few in number should be controlled with a shovel, herbicide, or other appropriate method, before populations become well-established.

2. Poisonous plants can cause unacceptable livestock losses. Implement control programs in grazing areas that are small enough and accessible. Fencing might be appropriate in serious cases, but herbicides or shovels are good tools if plants are widespread and relatively few. Poisonous plants frequently are the first to appear in spring. Delay introducing livestock into these areas until adequate forage is available, then do not overgraze. For more information on pasture management and poisonous plants, access the Oregon State University Small Farms website: http://smallfarms.oregonstate.edu

3. Certain perennial weeds—such as Himalayan blackberry, Canada thistle, leafy spurge, field bindweed, and quackgrass—cannot be discouraged by competition from vigorous forage plants. Herbicides, physical removal, or tillage are common control methods for these species, but consider grazing different livestock, such as goats or sheep, which may provide effective control.

4. If weeds have become so dense and the forage species so thin that the site is unprofitable, using herbicides or tillage may be the best management option. This should be done only when necessary.

When attempting to reduce weeds in small pastures, direct management and resources to promote growth of forage species so they will be better able to compete with the weeds. This concept is helpful in correcting certain weed problems and in slowing or preventing invasion of new weed species. Careful use of herbicides can be a useful tool for forage management. In terms of overall importance, livestock management follows closely behind management of the forage sites. The best chemical for forage production is probably fertilizer.
When herbicide use is justified, being able to buy products in the small quantities needed can be a problem. Do not buy more product than needed for the current year, when possible, because secure storage of the extra herbicide will be needed.

Below is a partial listing of some of the herbicide products available to effectively manage weeds in small pastures. This list changes continuously and herbicide brand names come and go; always refer to the active ingredients in this list when purchasing a product to apply to your pasture.

### Management to Reduce Weed Problems

#### 2,4-D (several products)

<table>
<thead>
<tr>
<th>Chemical family</th>
<th>Rate</th>
<th>Time</th>
<th>Remarks</th>
<th>Caution</th>
<th>Site of action</th>
<th>Chemical family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenoxy acetic acid</td>
<td>0.049 to 0.108 lb ae/A (3 to 7 fl oz/A)</td>
<td>Depends on target weeds. Apply to grass pastures when annual and biennial broadleaf weeds are small and actively growing, and established perennials are at bud stage, unless indicated otherwise on the label.</td>
<td>Controls many broadleaf weeds. The smaller the annual weeds, the easier they are to control. Spray biennial species in the seedling to rosette stage, before flower stalks are apparent. Spray perennial weeds while still seedlings (coming from seed), or wait until bud stage of growth.</td>
<td>Do not allow drift to desirable vegetation. Do not apply to newly seeded areas until grass is well established. Many forbs (desirable broadleaf plants) can be seriously injured or killed. Do not graze lactating dairy cattle in treated areas for 7 days after application. Preharvest interval is 30 days for hay. Do not permit animals being finished for slaughter to graze treated fields within 3 days of slaughter.</td>
<td>Group 4: synthetic auxins</td>
<td>Phenoxy acetic acid</td>
</tr>
</tbody>
</table>

### aminopyralid (Milestone Specialty Herbicide)

<table>
<thead>
<tr>
<th>Rate</th>
<th>Time</th>
<th>Remarks</th>
<th>Caution</th>
<th>Site of action</th>
<th>Chemical family</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.049 to 0.108 lb ae/A (3 to 7 fl oz/A)</td>
<td>Apply to actively growing broadleaf weeds. Consult label for application rates for specific weeds.</td>
<td>A nonionic surfactant at 1 to 2 quarts/100 gal of spray enhances control under adverse environmental conditions. Controls several broadleaf weeds. Application rate depends on weed species and stage of growth. Follow main label and supplemental label restrictions for grazing, forage and manure management.</td>
<td>Do not let spray drift onto desirable vegetation; many forbs (desirable broadleaf plants in pastures) will be seriously injured or killed. Do not use treated plant residues for compost.</td>
<td>Group 4: synthetic auxins</td>
<td>(aminopyralid) Pyridine</td>
</tr>
</tbody>
</table>

### aminopyralid + 2,4-D (ForeFront R&P Specialty Herbicide)

<table>
<thead>
<tr>
<th>Rate</th>
<th>Time</th>
<th>Remarks</th>
<th>Caution</th>
<th>Site of action</th>
<th>Chemical family</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.06 to 0.108 lb ae/A + 0.06 to 0.108 lb ae/A</td>
<td>Apply to actively growing broadleaf weeds. Consult label for application rates for specific weeds.</td>
<td>A nonionic surfactant applied at 0.25% to 0.5% v/v of spray enhances control under adverse environmental conditions. ForeFront R&amp;P controls many broadleaf weeds. Application rate depends on weed species and stage of growth. Follow main label and supplemental label restrictions for grazing, forage and manure management.</td>
<td>Do not let spray drift onto desirable vegetation; many forbs (desirable broadleaf plants in pastures) will be seriously injured or killed. Do not exceed the broadcast rate of 2.6 pints/A ForeFront R&amp;P per year. Do not use on grasses grown for seed or grasses grown for hay intended for export. Do not use treated plant residues for compost.</td>
<td>Group 4: synthetic auxins</td>
<td>(aminopyralid) Pyridine; (2,4-D) Phenoxy acetic acid</td>
</tr>
</tbody>
</table>

### aminopyralid + triclopyr (Capstone Specialty Herbicide)

<table>
<thead>
<tr>
<th>Rate</th>
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<th>Remarks</th>
<th>Caution</th>
<th>Site of action</th>
<th>Chemical family</th>
</tr>
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<tbody>
<tr>
<td>0.05 to 0.075 lb ae/A + 0.06 to 0.108 lb ae/A</td>
<td>Apply to actively growing broadleaf weeds. Consult label for application rates for specific weeds.</td>
<td>A nonionic surfactant applied at 0.25 to 0.5% v/v of spray enhances control under adverse environmental conditions. Capstone controls many broadleaf weeds and woody species. Application rate depends on weed species and stage of growth. Follow detailed supplemental label, preharvest intervals and main label restrictions for grazing, forage and manure management.</td>
<td>Do not let spray drift onto desirable vegetation; many forbs (desirable broadleaf plants in pastures) will be seriously injured or killed. Do not use treated plant residues for compost.</td>
<td>Group 4: synthetic auxins</td>
<td>(aminopyralid) Pyridine</td>
</tr>
</tbody>
</table>
carfentrazone (Aim EC)

Rate 0.0078 to 0.031 lb ai/A (0.5 to 2 fl oz/A Aim EC)

Time Apply to seedling grass pastures (at least 5 leaves) or established grass pastures up to the boot growth stage, and when broadleaf weeds are less than 6 inches tall.

Remarks The use of a nonionic surfactant, crop oil concentrate, or methylated seed oil is required. A high-quality sprayable liquid nitrogen fertilizer may be used at 2% to 4% v/v or AMS at 2 to 4 lb/A, in addition to the nonionic surfactant, COC, or MSO.

Caution There are no feeding or grazing restrictions following applications of Aim. Do not make applications less than 7 days apart or make more than 3 applications per growing season. Do not exceed a total of 5.9 oz/A per growing season.

Site of action Group 14: protoporphyrinogen oxidase (PPO) inhibitor

Chemical family Triazinone

chlorsulfuron (Telar XP and others)

Rate 0.19 to 1.0 oz ai/A (0.25 to 1.33 oz/A Telar XP)

Time Apply preemergence or postemergence to actively growing weeds.

Remarks Controls a wide range of broadleaf weeds. For best postemergence application results, apply with a nonionic surfactant. For perennial weed control, the best control occurs when applications are made at the bud to bloom stage or fall rosette growth stage. For annual weeds, apply at the seedling growth stage. There are no grazing restrictions for any livestock, including lactating animals, with application rates of 1 oz ai/A (1.33 oz/A) or less.

Caution Do not allow drift to desirable vegetation. Telar XP injures or kills desirable forbs including broadleaf forage species such as clovers and alfalfa. Bluegrass, bromes, orchardgrass and wheatgrasses tolerate rates of 0.25 to 1.0 oz/A. Fescue, bluestems, lovegrasses and wildrye tolerate rates of 0.25 to 0.5 oz/A. In general, apply to only well-established forage grasses. Do not apply more than 1.33 oz/A of Telar XP per year to pastures.

Site of action Group 2: acetolactate synthase (ALS) inhibitor

Chemical family Sulfonylurea

clopyralid + 2,4-D (Curtail)

Rate 0.19 to 0.38 lb ae/A clopyralid + 1 to 2 lb ae/A 2,4-D (2 to 4 quarts/A Curtail)

Time Apply to grass pastures when broadleaf weeds are actively growing.

Remarks Controls many broadleaf weeds. Application rate depends on weeds to be controlled and density of the infestation. The smaller the annual weeds, the easier they are to control. Spray biennial species in the seedling to rosette stage, and before flower stalks become apparent.

Caution Do not allow to drift onto desirable vegetation. Do not apply to newly seeded areas until grass is well established. Many forbs (desirable broadleaf plants, particularly legumes) can be seriously injured or killed. Do not graze lactating dairy cattle in treated areas for 14 days after application. Do not cut for hay within 7 days of application. Wait at least 2 weeks after application to graze animals scheduled for slaughter in 7 days or less.

Caution Do not use hay or straw from treated areas for composting or mulching. Note label restrictions on overseeding or reseeding.

Site of action (both) Group 4: synthetic auxin

Chemical family (clopyralid) pyridine; (2,4-D) phenoxy acetic acid

dicamba + 2,4-D (Weedmaster, Pasturemaster, or Latigo)

Rate 0.5 to 4 pints/A Weedmaster or Pasturemaster, or 0.33 to 2.5 pints/A Latigo, depending on weed species and size at application

Time Depends on target weeds; see label. In general, apply to grass pastures when annual and biennial broadleaf weeds are small and actively growing, and established perennials are at bud stage.

Remarks Controls broadleaf weeds. The smaller the annual weeds, the easier they are to control. Spray biennial species in the seedling to rosette stage, before flower stalks are apparent. Unless label indicates otherwise, spray perennial weeds while still seedlings (coming from seed), or wait until bud stage of growth.

Caution Do not allow drift to desirable vegetation. Do not apply to newly seeded areas until grass is well established. Many forbs (desirable broadleaf plants) can be seriously injured or killed. For Weedmaster and Latigo, do not graze lactating dairy cattle in treated areas for 7 days after application. Do not cut for hay for lactating dairy animals within 37 days of application. Do not permit animals being finished for slaughter to graze treated fields within 30 days of slaughter. For Pasturemaster, do not graze dairy animals on treated areas until 21 days after application of 1 gallon (1 lb ai/A) or 40 days for up to 2 gallons (2 lb ai/A). Remove meat animals from treated areas 30 days prior to slaughter. Do not cut grass hay within 51 days of application of 1 gallon (1 lb ai/A) or within 70 days for up to 2 gallons (2 lb ai/A). Note label restrictions on overseeding or reseeding.

Site of action (both) Group 4: synthetic auxin

Chemical family (dicamba) benzoic acid; (2,4-D) phenoxy acetic acid

dicamba + diflufenopyr (Distinct, Overdrive)

Rate 4 to 8 oz/A

Time Apply to grass pastures when annual and biennial broadleaf weeds are small and actively growing. Can also be applied in the fall to senesced knapweed species for control the following spring.

Remarks Controls broadleaf weeds. The smaller the annual weeds, the easier they are to control. Spray biennial species in the seedling to rosette stage, before flower stalks are apparent.

Caution Do not allow drift to desirable vegetation. Do not apply to newly seeded areas until grass is well established. Many forbs (desirable broadleaf plants) and legumes can be seriously injured or killed by applications. Use with a nonionic surfactant or methylated seed oil to maximize weed control efficacy. There are no feeding or grazing restrictions when using these products.

Site of action (dicamba) Group 4: synthetic auxin; (diflufenopyr) Group 19; auxin transport

Chemical family (dicamba) benzoic acid; (diflufenopyr) semicarbazone

PNW Weed Management Handbook
Pasture and Rangeland W-3
**glyphosate (several products)**

- **Rate**: Consult label. Several concentrations of glyphosate are available.
- **Time**: Depends on weed or brush species to be controlled. Annual weeds are best controlled when small and actively growing. Apply to perennial weeds at or beyond full flower, or in late summer, or fall after seed forms but before a killing frost.
- **Remarks**: Controls susceptible grass and broadleaf plants including many desirable grasses and forbs. Use as a spot treatment, treating up to 10% of any area. Repeat applications can be made in the same area at 30-day intervals. Glyphosate is nonselective and may control all vegetation present, so consider reseeding the areas treated.

**Caution**: Will kill forage plants on contact; do not allow drift onto desirable vegetation. Remove livestock before applying, and do not graze or harvest for 14 days after application. Do not exceed 6 lb ae/A or 8 lb ai/A per year.

- **Site of action**: Group 9: inhibits EPSP synthase
- **Chemical family**: Pyridine

**fluroxypyr (Vista XRT and others)**

- **Rate**: 0.13 to 0.48 lb ae/A (6 to 22 oz/A Vista XRT)
- **Time**: Apply to established grasses when broadleaf weeds and woody brush species are actively growing in noncropland areas, including grazed sites within those areas.
- **Remarks**: Only weeds emerged at the time of application will be controlled. Optimum weed control efficacy will occur when applications are made in warm conditions, with ambient temperatures of 55 to 85°F. Use the lower rates on broadleaf weeds less than 4 inches tall. There are no grazing restrictions for lactating dairy animals.

**Caution**: Do not exceed 22 oz/A of Vista XRT per growing season. Preharvest interval is 7 days for hay or silage. Remove meat animals from treated forage at least 2 days before slaughter.

- **Site of action**: Group 4: synthetic auxin
- **Chemical family**: Benzoic acid

**dicamba + halosulfuron (Yukon)**

- **Rate**: 4 to 8 oz/A
- **Time**: Apply to grass pastures when annual and biennial broadleaf weeds and yellow nutsedge are small and actively growing.
- **Remarks**: Controls broadleaf weeds and yellow nutsedge. The smaller the annual weeds, the easier they are to control. Spray biennial species in the seedling to rosette stage, before flower stalks are apparent.

**Caution**: Do not allow drift to desirable vegetation. Do not apply to newly seeded areas until grass is well established. Many forbs (desirable broadleaf plants) and legumes can be seriously injured or killed by Yukon herbicide. Use with a nonionic surfactant or methylated seed oil to maximize weed control efficacy. There are no grazing restrictions when using Yukon. The preharvest interval for grass forage production is 37 days. Do not apply more than 8 oz of Yukon per year.

- **Site of action**: (dicamba) Group 4: synthetic auxin; (halosulfuron) Group 2; acetolactate synthase (ALS) inhibitor
- **Chemical family**: (dicamba) benzoic acid; (halosulfuron) sulfonylurea

**halosulfuron (Sandea)**

- **Rate**: 0.03 to 0.06 lb ai/A halosulfuron (0.66 to 1.33 oz/A Sandea)
- **Time**: Apply to pasture when yellow nutsedge is small and actively growing.
- **Remarks**: Controls yellow nutsedge. May be applied as a post-mergence broadcast application or as a spot treatment. A second spot treatment may be necessary to control yellow nutsedge. Use with a nonionic surfactant or methylated seed oil to maximize weed control efficacy.

**Caution**: Do not allow drift to desirable vegetation. Do not apply more than 1.33 oz of Sandea per year. There are no grazing restrictions following Sandea applications. Forage preharvest interval is 37 days.

- **Site of action**: Group 2; acetolactate synthase (ALS) inhibitor
- **Chemical family**: Sulfonylurea

**MCPA (several products)**

- **Rate**: 1 to 1.85 lb ae/A (2.16 to 4 pints/A Shredder or other MCPA-4 formulations)
- **Time**: Apply to annual broadleaf weeds when small and actively growing. Spray perennials in early-bud to full-bloom stage and during regrowth in fall.

**Remarks**: Controls certain annual broadleaf and perennial weeds in grass pastures.

**Caution**: Do not graze dairy animals or meat animals intended for slaughter for 7 days after treatment. Preharvest interval is 21 days for hay. Do not use this treatment if alfalfa is present and desired. Do not use if temporary injury to clovers cannot be tolerated. Do not use on newly seeded areas until grass is well established. Do not use from early boot to milk stage if grass seed production is desired.

- **Site of action**: Group 4: synthetic auxin
- **Chemical family**: Phenoxy acetic acid

**metsulfuron (Escort XP and others)**

- **Rate**: 0.06 to 0.6 oz ai/A (0.1 to 1.0 oz/A Escort XP)
- **Time**: Apply to actively growing weeds.

**Remarks**: Consult labels, which differ significantly. Information for Escort XP is provided by supplemental labels (Section 2(ee) recommendation for pastures). Controls a wide range of broadleaf weeds. For best results, apply with a nonionic or silicone surfactant. No grazing restrictions for any livestock, including lactating animals, with application rates of 1 oz ai/A (1.67 oz/A) or less. Note restrictions on timothy, fescue, and ryegrass pastures. Note recropping intervals.

**Caution**: Do not allow drift to desirable vegetation. Injures or kills desirable forbs. Do not apply more than 1.67 oz/A of Escort XP per year.

- **Site of action**: Group 2: acetolactate synthase (ALS) inhibitor
- **Chemical family**: Sulfonylurea
### Quinclorac (Paramount)

**Rate**: 0.06 to 0.75 lb ae/A

**Time**: Apply to established grasses when weeds are growing well.

**Remarks**: To control many annual and perennial broadleaf weeds and woody plant species.

**Caution**: A restricted-use herbicide. Legumes are highly sensitive to quinclorac.

**Site of action**: Group 4: synthetic auxin

**Chemical family**: Quinoline carboxylic acid

### Pyraflufen (Edict 2SC IVM)

**Rate**: 0.001 to 0.005 lb ai/A (1.0 oz/A to 3.5 oz/A Edict 2SC IVM)

**Time**: Apply to broadleaf seedlings that are less than 4 inches tall or less than 3 inches in diameter if in the rosette stage. Thorough, uniform spray coverage is essential for good control of broadleaf weeds.

**Remarks**: For postemergence broadleaf weed control in improved pastures. May be tank mixed with the synthetic auxin herbicides to broaden the weed control spectrum. Always apply with a methylated seed oil or nonionic surfactant at a rate of 0.5% v/v for optimum activity.

**Caution**: Do not exceed two applications per season. Allow a minimum of 14 days between applications. Do not apply more than 7 oz/A per season. Livestock may graze treated area as soon as foliage is dry after application.

**Site of action**: Group 14: protoporphyrinogen oxidase (PPO) inhibitor

**Chemical family**: Phenylpyrazole

### Quinclorac (several products)

**Rate**: 0.06 to 0.5 lb ae/A

**Time**: Apply to established grasses when weeds are growing well.

**Remarks**: To control many annual and perennial broadleaf weeds and woody plant species.

**Caution**: A restricted-use herbicide. Legumes are highly sensitive to quinclorac.

**Site of action**: Group 4: synthetic auxin

**Chemical family**: Quinoline carboxylic acid

### Pyraflufen (Edict 2SC IVM)

**Rate**: 0.001 to 0.005 lb ai/A (1.0 oz/A to 3.5 oz/A Edict 2SC IVM)

**Time**: Apply to broadleaf seedlings that are less than 4 inches tall or less than 3 inches in diameter if in the rosette stage. Thorough, uniform spray coverage is essential for good control of broadleaf weeds.

**Remarks**: For postemergence broadleaf weed control in improved pastures. May be tank mixed with the synthetic auxin herbicides to broaden the weed control spectrum. Always apply with a methylated seed oil or nonionic surfactant at a rate of 0.5% v/v for optimum activity.

**Caution**: Do not exceed two applications per season. Allow a minimum of 14 days between applications. Do not apply more than 7 oz/A per season. Livestock may graze treated area as soon as foliage is dry after application.

**Site of action**: Group 14: protoporphyrinogen oxidase (PPO) inhibitor

**Chemical family**: Phenylpyrazole

### Quinclorac (Paramount)

**Rate**: 0.14 to 0.75 lb ai/A (3 to 16 oz/A Paramount)

**Time**: For the control and suppression of broadleaf perennial weeds and some broadleaf annual species. For field bindweed control apply in fall, but before a killing frost. Field bindweed should be actively growing and at least 4 inches long. Repeat applications are necessary to maintain adequate control.

**Remarks**: May be used on Kentucky bluegrass, orchardgrass, annual and perennial ryegrass, and fine and tall fescue pasture mixes as well as other cool season grasses listed on the label. Adequate soil moisture and/or light rain after application is required for root uptake. Adding methylated seed oil or crop oil concentrate is required for consistent control. Nitrogen solutions or ammonium sulfate can be added to enhance control but should not replace the MSO or COC.

**Caution**: Do not harvest treated area for hay within 7 days of treatment.

**Site of action**: Group 4: synthetic auxin

**Chemical family**: Quinoline carboxylic acid

### Saflufenacil (Sharpen)

**Rate**: 0.022 to 0.045 lb ai/A (1 to 2 fl oz/A Sharpen)

**Time**: Apply only to established stands (defined as grass planted in fall or spring that has gone through a first cutting/mowing) of perennial cool-season forage grasses to control annual broadleaf weeds.

**Remarks**: A methylated seed oil is required for maximum efficacy. See Sharpen label for more information on adjuvants and tank-mixes. There are no grazing or feeding restrictions following applications of Sharpen.

**Caution**: Do not exceed 6 fl oz/A per year. Sharpen may cause transitory injury to forage grasses (leaf necrosis) under certain conditions, but new growth is normal and vigor is not reduced. Sharpen will severely injure or kill some desirable broadleaf forages including clovers.

**Site of action**: Group 14: protoporphyrinogen oxidase (PPO) inhibitor

**Chemical family**: Pyrimidindione

### Sulfosulfuron (Outrider)

**Rate**: 0.035 to 0.062 lb ai/A (0.75 to 1.33 oz/A Outrider)

**Time**: Apply postemergence in the spring or fall to actively growing weeds.

**Remarks**: Controls select annual grasses and a range of broadleaf weeds. Review label for list of weed species controlled and information on grass species selectivity. Always apply Outrider with a nonionic surfactant. There are no grazing restrictions for any livestock, but for best weed control efficacy do not mow or graze the treated pasture for 2 weeks prior to or after application.

**Caution**: This product is selective in crested wheatgrass, and selectivity in other pasture grasses is increased when they are not actively growing. If concerns exist about selectivity on desirable pasture grasses, a small area of the pasture should be treated to confirm selectivity prior to treating entire pasture.

**Site of action**: Group 2: acetolactate synthase (ALS) inhibitor

**Chemical family**: Sulfonylurea

### Triasulfuron (Amber)

**Rate**: 0.21 to 0.42 oz ai/A (0.28 to 0.56 oz/A Amber)

**Time**: Apply preemergence (for partial control of downy brome and cheat at the 0.56-oz/A rate) or postemergence to actively growing weeds.

**Remarks**: Controls a wide range of broadleaf weeds when tank mixed with herbicides having another mode of action. See Amber label for tank-mix recommendations for specific weed species. For best postemergence application results, apply with a nonionic surfactant.

**Caution**: See label for list of tolerant forage grass species. Orchardgrass, red fescue (fine fescues) and ryegrasses are likely to be injured by Amber. In general, apply to only tolerant grasses which have been established for at least 60 days. Amber Injures or kills desirable forbs including broadleaf forage species, such as clovers and alfalfa. There are no grazing restrictions, but do not harvest treated areas as hay for 30 days following applications of Amber.

**Site of action**: Group 2: acetolactate synthase (ALS) inhibitor

**Chemical family**: Sulfonylurea
**triclopyr (several products)**

**Rate** 0.75 to 2 lb ae/A (1 quart to 0.66 gal/A product)

**Time** Apply to grass pastures when broadleaf weeds and woody plants are actively growing.

**Remarks** Adjust rate for type of vegetation to be controlled. Controls both emerged herbaceous and woody broadleaf plants. To control biennial thistles or other biennial species, apply before flower stalks appear. Add an approved nonionic surfactant to the spray mix.

**Caution** Do not allow drift to desirable vegetation. Many forbs (desirable broadleaf plants) can be seriously injured or killed. Do not allow grazing or harvest green forage for lactating dairy animals from treated areas during the same growing season after application. Withdraw livestock from grazing treated grass at least 3 days before slaughter during the season of application. Preharvest interval is 14 days for hay.

**Site of action** Group 4: synthetic auxin

**Chemical family** Pyridine

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**triclopyr + 2,4-D (Crossbow and others)**

*May not be applied to forage that will be cut and sold for commercial purposes*

**Rate** 1% to 1.5% solution for spot treatments or up to 1 gal/A, depending on target weeds.

**Time** Apply to grass pastures when broadleaf weeds are actively growing.

**Remarks** May not be applied to forage that will be cut and sold for commercial purposes. Controls many broadleaf weeds. The smaller the annual weeds, the easier they are to control. Spray biennial weeds in the seedling to rosette stage, before flower stalks are apparent. This herbicide mixture is also very effective on a number of woody species.

**Caution** Do not allow to drift to desirable vegetation. Do not apply to newly seeded areas until grass is well established. Many forbs (desirable broadleaf plants) can be seriously injured or killed. Note restrictions on label, particularly for grazing lactating dairy cattle, and for overseeding or reseeding.

**Site of action** (both) Group 4: synthetic auxin

**Chemical family** (triclopyr) pyridine; (2,4-D) phenoxy acetic acid
Controlling undesirable plants on rangeland is an important part of an overall range management program. Undesirable plants use space, moisture, and nutrients that could be put to better use producing forage for grazing animals. Poisonous plants are an additional threat to animal health and productivity.

Weed and brush control are not in themselves range management, but are merely tools available to the manager. Controlling undesirable plants usually requires more intensive management. In most cases, it is futile to try to control undesirable plants without improving management.

Other methods Methods that have a definite place in range management are: chemical, rotoeating, plowing, diskning, chaining, burning, reseeding, and changes in grazing schedules. There are specific sites and reasons for use of the controls listed. Each is effective if used properly. Obtain specific information locally from the county Extension agent or professional range manager.

Safety and toxic hazard The toxicity of chemicals used in range weed control is low. No evidence of direct damage to animals as a result of these herbicides is available. However, take all precautions to prevent drift and damage to susceptible plants in the vicinity.

Methods of chemical application Methods of application depend on the species, terrain, and size of the area. In most extensive range weed control projects, the herbicide is applied by aircraft, either fixed-wing or helicopter. However, ground equipment may be used successfully. On small areas, ground or hand equipment may be most economical.

Some pastures contain poisonous plants. Grazing livestock normally do not eat many poisonous plants, but sometimes the composition of plants change after spraying. This can make some plants more palatable. Do not graze pastures known to have poisonous plants for at least 3 weeks after spraying.

Spot-spray to control perennial weeds in pastures. Follow recommendations to control specific weeds.

Many crops are grazed or used for pasture. When areas not generally defined as pasture are to be grazed, examine the herbicide label to determine what grazing restrictions apply before using the herbicide.

Caution This handbook is not intended as a complete guide to herbicide use. Before using any chemical, read the label on the container. Before a chemical can be recommended for a specific use, it must be thoroughly tested. The recommendation on the manufacturer's label, when followed, can prevent many problems arising from the wrong use of a chemical.

Management to Reduce Weed Problems

2,4-D (several products)

<table>
<thead>
<tr>
<th>Chemical family</th>
<th>Phenoxy acetic acid</th>
</tr>
</thead>
</table>

Weed Control in Pasture and Rangeland

Tim Prather

Revised June 2017

<table>
<thead>
<tr>
<th>Chemical family</th>
<th>Pyridine</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>aminopyralid (Milestone)</th>
<th>0.75 to 1.75 oz ae/A (3 to 7 oz/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Apply postemergence to actively growing plants or in the fall over senesced Russian knapweed plants or preemergence or postemergence for marestail control.</td>
</tr>
<tr>
<td>Remarks</td>
<td>Controls a range of broadleaf weeds, including many in the sunflower and legume families. No restrictions on grazing or hay harvest. Surfactants have similar effects in combination with aminopyralid.</td>
</tr>
</tbody>
</table>

Caution Do not exceed 7 oz/A of Milestone in 1 year. Allow 3 days after grazing on aminopyralid-treated forage before moving grazing animals to areas with plants sensitive to aminopyralid. Do not use plant residues that were treated within 3 days before harvest for compost or mulch that will be applied to susceptible broadleaf plants. Hay cannot be moved off farm if treated with Milestone in the preceding 18 months, unless allowed by supplemental labels; see label for details.

<table>
<thead>
<tr>
<th>Site of action</th>
<th>Group 4: synthetic auxin</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>aminopyralid + 2,4-D (Forefront R&amp;P)</th>
<th>1.5 to 2.6 pints/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Apply when weeds are young and actively growing.</td>
</tr>
<tr>
<td>Remarks</td>
<td>Use 1.5 to 2 pints/A on common vetch, yellow woodsorrel, and absinth wormwood. Most susceptible species can be controlled with 2 to 2.6 pints/A.</td>
</tr>
</tbody>
</table>

Caution Do not plant grasses for 30 days after application. Do not use on newly seeded grass areas until grass is well established. May suppress smooth bromegrass. Do not spray pastures containing desirable forbs, especially legumes, unless injury can be tolerated. Allow 3 days after grazing before moving animals to areas with desirable sensitive broadleaf plants. Do not graze dairy cattle in treated area for 14 days after application. Remove meat animals from area 7 days before slaughter if pasture was treated less than 2 weeks earlier. Do not cut hay within 14 days after application. Do not use straw or manure from treated areas for compost or mulch.

<table>
<thead>
<tr>
<th>Site of action</th>
<th>(both) Group 4: synthetic auxin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical family</td>
<td>(aminopyralid) pyridine; (2,4-D) phenoxy acetic acid</td>
</tr>
</tbody>
</table>

PNW Weed Management Handbook
Pasture and Rangeland W-7
**chlorosulfuron (Telar)**

**Chemical family** Triazinone

**Rate** 0.25 to 1.33 oz/A

**Time** For perennial weeds, apply at budding or flowering stage or in fall at rosette stage. Apply early in life cycle of annual weeds.

**Remarks** Bluegrass, bromes, orchardgrass, and wheatgrasses tolerate rates of 0.25 to 1 oz/A. Fescue, bluestems, lovegrasses, and wild rye tolerate rates of 0.25 to 0.5 oz/A. Apply only to established grasses. Telar applied before flowering can reduce seed head development of cool-season grasses.

**Caution** Stressed grasses may be injured. No grazing or harvest restrictions for applications up to 1.33 oz/A. Do not exceed 1.33 oz/A per year.

**Site of action** Group 2: acetolactate synthase (ALS) inhibitor

**Chemical family** Sulfonyleurea

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**clopyralid (Stinger or Transline)**

**Chemical family** Pyridine

**Rate** 0.5 to 1.33 pints/A

**Time** Apply to young, actively growing weeds. Established grasses are tolerant. Apply to Canada thistle after most basal leaves have emerged but before bud stage.

**Remarks** Apply only once in a 12-mo period. Do not allow drift to crops. May be tank mixed with 2,4-D. Grasses may be planted any time after application.

**Caution** Do not apply to crops. May be tank mixed with 2,4-D. Grasses may be planted any time after application.

**Site of action** Group 4: synthetic auxin

**clopyralid + 2,4-D (Curtail)**

**Chemical family** (clopyralid) pyridine; (2,4-D) phenoxy acetic acid

**Rate** 2 to 4 quarts/A

**Time** Apply when weeds are young and actively growing.

**Remarks** Use 2 quarts/A on light to moderate infestations of Canada thistle and knapweeds (spotted and diffuse) in good growing conditions. Use 3 quarts/A for dense infestations or under poor growing conditions. On Russian knapweed, use 3 to 4 quarts/A.

**Caution** Do not plant grasses for 30 days after application. Do not use on newly seeded grass areas until grass is well established. Do not use on bentgrass. Do not spray pastures containing desirable forbs, especially legumes, unless injury can be tolerated. Do not use any time after application.

**Site of action** (both) Group 4: synthetic auxin

**dicamba (Banvel, Vanquish, or Clarity)**

**Chemical family** Benzoic acid

**Rate** 0.25 to 1 lb ae/A

**Time** Apply after weeds emerge. Treat annuals when small and actively growing. See label for proper timing and rates on perennials.

**Remarks** Controls many annual, biennial, and perennial broadleaf weeds and many woody brush and vine species. Rate depends on weed species and growth stage at time of treatment. Can be applied using water, oil-water emulsions, or sprayable fluid fertilizer as the carrier. May also be applied as a cut-surface treatment to control unwanted trees or to prevent sprouts on cut trees.

**Caution** No waiting period between treatment and grazing non-lactating animals (see label for timing restrictions on dairy animals). Meat animals must be removed from treated areas 30 days before slaughter. Rates over 2 lb ai/A may temporarily injure many grass species. Newly seeded grasses (see label) may be injured at rates exceeding 0.75 lb ae/A. Do not exceed 8 lb ae/A per season. Kills legumes.

**Site of action** Group 4: synthetic auxin

**PNW Weed Management Handbook**

**Pasture and Rangeland W-8**
**dicamba + 2,4-D (Weedmaster or Pasturemaster)**

<table>
<thead>
<tr>
<th>Chemical family</th>
<th>Site of action</th>
<th>Site of action (both)</th>
<th>Rate</th>
<th>Time</th>
<th>Remarks</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>(dicamba) benzoic acid; (2,4-D) phenoxy acetic acid</td>
<td>(both) Group 4: synthetic auxin</td>
<td>(both) Group 4: synthetic auxin</td>
<td>0.5 to 4 pints product/A</td>
<td>When weeds are actively growing.</td>
<td>For pasture, range, and non-cropland. Spot spraying rates can go as high as 6 pints/A; see label for weeds controlled at higher rates.</td>
<td>Do not apply when grass is in boot stage. See label for grazing restrictions.</td>
</tr>
</tbody>
</table>

**dicamba + diflufenzopyr (Overdrive)**

<table>
<thead>
<tr>
<th>Chemical family</th>
<th>Site of action</th>
<th>Site of action (both)</th>
<th>Rate</th>
<th>Time</th>
<th>Remarks</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>(dicamba) benzoic acid; (diflufenzopyr) Group 19; auxin transport</td>
<td>(both) Group 4: synthetic auxin</td>
<td>(both) Group 4: synthetic auxin</td>
<td>4 to 8 oz/A</td>
<td>Apply postemergence to actively growing plants or in the fall over senesced Russian knapweed plants or preemergence or postemergence for marestail control.</td>
<td>Controls a range of broadleaf weeds with lower rates used on annual weeds and higher rates on perennial weeds. Will injure desirable legumes. Use a nonionic surfactant or methylated seed oil.</td>
<td>Do not plant any crop for 30 days after application. Grazing is possible immediately after application.</td>
</tr>
</tbody>
</table>

**dicamba + trifluralin (Starane Ultra)**

<table>
<thead>
<tr>
<th>Chemical family</th>
<th>Site of action</th>
<th>Site of action (both)</th>
<th>Rate</th>
<th>Time</th>
<th>Remarks</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semicarbazone</td>
<td>Group 4: synthetic auxin</td>
<td>(both) Group 4: synthetic auxin</td>
<td>0.5 to 1.33 pints/A</td>
<td>Apply after weeds emerge. In pastures, use the low rate for weeds less than 4 inches tall, and 0.66 pint/A for weeds less than 8 inches tall. Rates up to 1.33 pints/A can be used on Conservation Reserve Program (CRP) land.</td>
<td>Controls an array of broadleaf weeds with lower rates used on annual weeds and higher rates on perennial weeds. Will injure desirable legumes. Use a nonionic surfactant or methylated seed oil.</td>
<td>Do not apply when grass is in boot stage. See label for grazing restrictions.</td>
</tr>
</tbody>
</table>

**glyphosate (several products)**

<table>
<thead>
<tr>
<th>Chemical family</th>
<th>Site of action</th>
<th>Site of action (both)</th>
<th>Rate</th>
<th>Time</th>
<th>Remarks</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>(several products)</td>
<td>Group 9: inhibits EPSP synthase</td>
<td>None generally accepted</td>
<td>0.1875 to 3.75 lb ae/A</td>
<td>Annual weeds are best controlled when small and actively growing. Apply to actively growing perennial weeds at or beyond full flower. Results are best if applied in late summer or fall after fruit forms. Fall treatments must be before a killing frost.</td>
<td>Controls many annual and perennial weed species before renovating pastures. Rates depend on weed species, stage of growth, and density. Repeat treatments may be necessary to control weeds regenerating from underground parts or seed. May also be applied as a spot treatment or by wiper application to established pastures, but do not treat more than 10% of any acre at one time. Further applications may be made to the same area at 30-day intervals.</td>
<td>A nonselective herbicide that kills forage plants on contact. Total treatments must not exceed 8 lb ai/A per year. Remove domestic livestock before application. Wait 8 weeks after broadcast application and 14 days after spot or wiper application before grazing or harvesting.</td>
</tr>
</tbody>
</table>

**hexazinone (Velpar L)**

<table>
<thead>
<tr>
<th>Chemical family</th>
<th>Site of action</th>
<th>Site of action (both)</th>
<th>Rate</th>
<th>Time</th>
<th>Remarks</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triazinone</td>
<td>Group 5: photosystem II inhibitor</td>
<td>(both) Group 5: photosystem II inhibitor</td>
<td>2.75 to 4.5 pints/A per season.</td>
<td>Just before or during period of active growth of brush species to be controlled.</td>
<td>Controls for control of herbaceous and woody weeds in range and pastures.</td>
<td>Do not apply to brush standing in water, or where desirable trees or shrubs are growing immediately adjacent to weedy plants. Do not cut hay from treated areas. Do not use on marshy or poorly drained sites, or on soils classified as clays. Do not apply to snow-covered or frozen ground.</td>
</tr>
</tbody>
</table>

**fluroxypyr + picloram (Surmount)**

<table>
<thead>
<tr>
<th>Chemical family</th>
<th>Site of action</th>
<th>Site of action (both)</th>
<th>Rate</th>
<th>Time</th>
<th>Remarks</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyridine</td>
<td>(both) Group 4: synthetic auxin</td>
<td>(both) Group 4: synthetic auxin</td>
<td>1.5 to 2.5 pints/A (herbaceous) or 3 to 4 pints/A (woody)</td>
<td>Apply after weeds emerge. Apply low rate to actively growing, small weeds and up to 2 pints/A when weeds are dense or not growing well.</td>
<td>Controls a range of broadleaf weeds with lower rates used on annual weeds and higher rates on perennial weeds. Will injure desirable legumes. Use a nonionic surfactant or methylated seed oil.</td>
<td>Do not apply when grass is in boot stage. See label for grazing restrictions.</td>
</tr>
</tbody>
</table>

**fluroxypyr + triclopyr (PastureGard)**

<table>
<thead>
<tr>
<th>Chemical family</th>
<th>Site of action</th>
<th>Site of action (both)</th>
<th>Rate</th>
<th>Time</th>
<th>Remarks</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>(both) pyridine</td>
<td>(both) Group 4: synthetic auxin</td>
<td>(both) Group 4: synthetic auxin</td>
<td>1.5 to 3 pints/A (herbaceous) or 3 to 8 pints/A (woody)</td>
<td>Apply after weeds emerge and are still small, not after flower bud stage. Apply low rate to actively growing annual weeds and apply 2 to 3 pints/A to biennial or perennial weed species.</td>
<td>Do not use on bentgrass. Wait at least 3 weeks after application to reseed. Apply to new plantings after grasses are tillering.</td>
<td>Do not exceed 8 pints/A in one growing season. Do not treat more than 10% of any acre at one time. Further applications may be made to the same area at 30-day intervals.</td>
</tr>
</tbody>
</table>

**dicamba + 2,4-D (Weedmaster or Pasturemaster)**

**glyphosate (several products)**

**hexazinone (Velpar L)**

**fluroxypyr + picloram (Surmount)**

**fluroxypyr + triclopyr (PastureGard)**
metsulfuron-methyl + dicamba + 2,4-D (Cimarron Max)

**Rate** 0.25 oz/A metsulfuron-methyl + 1 pint/A dicamba + 2,4-D to 1 oz/A metsulfuron-methyl + 4 pints/A dicamba + 2,4-D. The label tells how to select the use rate, given weed spectrum and sizes.

**Time** Apply pre- or post-emergence. Results are best if applied to young, actively growing weeds.

**Remarks** Cimarron Max is a co-pack with two components: 1) metsulfuron-methyl and 2) a combination of dicamba and 2,4-D at 1 lb ai/gal dicamba and 2.87 lb ai/gal 2,4-D.

**Caution** Weeds often are less susceptible after exposure to cold weather or drought.

**Site of action** (metsulfuron-methyl) Group 2: acetolactate synthase (ALS) inhibitor; (dicamba and 2,4-D) Group 4: synthetic auxin

**Chemical family** (metsulfuron-methyl) sulfonylurea; (dicamba) benzoic acid; (2,4-D) phenoxy acetic acid

pendimethalin (Prowl H2O)

**Rate** 1 to 4 lb ai/A (1.1 to 4.2 quarts/A )

**Time** Apply prior to emergence of weeds.

**Remarks** Controls annual grasses and some broadleaf weeds as they germinate.

**Caution** Application rate depends on soil texture; coarse soils require less herbicide. Do not apply more than 4.2 quarts/A in a crop season. Grazing restrictions apply; do not graze before 45 days after application.

**Site of action** Group 3: microtubule assembly

**Chemical family** Dinitroaniline

picloram (Tordon 22K)

**Rate** 0.5 pint to 2 quarts/A

**Time** Treat when weeds are growing actively, in the spring before full bloom, or in late summer or fall. Re-treat in subsequent years as needed.

**Remarks** Controls many troublesome perennial and woody weed species including thistles, yellow starthistle, leafy spurge, knapweeds, field bindweed, rabbitbrush, rush skeletonweed, and poison-oak. Rates depend on weed species and plant density. Apply at rates over 0.5 lb ae/A as spot-treatments only and not to exceed 25% of landowner’s acreage in any particular watershed in a single season.

**Caution** Most formulations are restricted-use herbicides. Do not apply on or near susceptible crops or desirable plants. Label includes buffer zone restrictions, air temperature limits, and grazing restrictions. Do not contaminate water or where surface water from treated areas can run off to adjacent cropland. Do not apply to inner bank or bottom of irrigation ditches. Do not apply to snow or frozen ground. Do not allow grazing in areas where poisonous plants were sprayed until plants have died, herbicide may increase palatability. Do not spray pastures if the forage legume component is desired. Do not move treated soil. Do not transfer livestock onto crop areas for at least 7 days after grazing on land treated with picloram. See label for other grazing restrictions.

**Site of action** Group 4: synthetic auxin

**Chemical family** Pyridine

PNW Weed Management Handbook
Pasture and Rangeland W-10
### triasulfuron (Amber)

**Rate** 0.013 to 0.026 lb ai/A (0.28 to 0.56 oz/A)

**Time** Apply postemergence to actively growing weeds. Apply preemergence to downy brome and cheat (see Remarks).

**Remarks** Apply in a tank-mix with an appropriate herbicide having another mode of action to control a wide spectrum of broadleaf weeds. Add a nonionic surfactant to the spray mixture. Consult label for tolerant grasses. Apply high rate listed above for preemergent, partial control of downy brome and cheat. Rate and annual rainfall affect haying and grazing restrictions; see label. Do not apply more than 2 quarts in one growing season.

**Site of action** Group 2: acetolactate synthase (ALS) inhibitor

**Chemical family** Substituted urea

### triasulfuron + dicamba (Rave)

**Rate** 2 to 4 oz/A

**Time** Apply postemergence to actively growing weeds.

**Remarks** Add a nonionic surfactant to the spray mixture. Consult label for tolerant grasses.

**Caution** Wait 60 days after grasses emerge before applying Rave. Orchardgrass, red fescue, and ryegrasses will likely be injured. Clovers and alfalfa also may be injured. After applying, wait at least 30 days to cut for hay or to slaughter meat animals that were exposed, and wait at least 8 days to graze lactating cows.

**Site of action** (triasulfuron) Group 2: acetolactate synthase (ALS) inhibitor; (dicamba) Group 4: synthetic auxin

**Chemical family** (triasulfuron) sulfonylurea; (dicamba) benzoic acid

### triallate + 2,4-D (Crossbow)

**Rate** Spot treatment: use 1 to 1.5% mixture in water. Broadcast: up to 1.5 gal/A (3 lb ae of 2,4-D and 1.5 lb ae of triallate).

**Time** Postemergence, to actively growing plants.

**Remarks** Controls many woody plants as well as annual and perennial broadleaf weeds.

**Caution** No forage may be sold for commercial purposes.

**Site of action** (both) Group 4: synthetic auxin

**Chemical family** (triclopyr) pyridine; (2,4-D) phenoxy acetic acid