

# CONSIDERATIONS FOR HERBICIDE USE IN PASTURES

## Weed Facts WF-17



### Why use herbicides

Weeds are often not desirable in pastures for many reasons. Many weeds are less palatable to animals, weeds decrease rapidly in nutritive value as they mature, and some can be toxic if consumed in large enough quantities. Weeds can also reduce the amount of desirable vegetation. Weed infestations can often be prevented by implementing cultural practices that maintain a dense cover of desirable forage where weeds find it difficult to germinate and grow. When forage competition is weakened, or when intolerable weed species are present, herbicide applications are often needed to manage weeds.

### Control vs. Renovation

Forage stands should be evaluated to determine stand composition prior to applying herbicides. First, it is critical to know the weed species present and their growth stages to decide which herbicide(s) will provide control and what rate(s) to use. Second, in compromised stands, the percent of undesirable species and/or bare ground must be known to decide if over-seeding or renovation will be necessary to improve the forage stand. If undesirable species and/or bare ground comprise less than 30% of the total ground cover, timely herbicide applications coupled with good forage management practices will usually be sufficient to improve the stand. If undesirable species and/or bare ground comprise 30 to 50 % of the total ground cover, over-seeding will need to follow herbicide applications. Herbicides must be chosen that will allow over-seeding of

forages within a reasonable period of time. If more than 50% of the total ground cover is comprised of undesirable species and/or bare ground, renovation will be necessary to improve the stand. Renovation is accomplished by killing all of the existing vegetation with a non-selective burndown herbicide such as glyphosate (sold as Roundup or other trade names) and/or tillage (plowing, disking, etc.), and then re-seeding the forage crop.

### Chemical weed control in grass forage

No herbicides are currently available for control of grass weeds in grass forage, so cultural and mechanical practices alone must be relied upon for grass weed control. Several herbicides are available, however, for broadleaf weed control. **Active ingredient** is the term that defines the chemical in an herbicide formulation primarily responsible for its phytotoxicity (ability to injure or kill plants). Some herbicides contain only one active ingredient while others contain two or more. While up to a dozen different active ingredients are available for use in grass forage, a combination of the active ingredients 2,4-D and dicamba is considered the "standard" treatment for our area, is effective on many weeds when applied at the appropriate growth stage, and is relatively inexpensive. 2,4-D is sold under a variety of trade names, dicamba is commonly sold as Banvel or Clarity, and a premix combination is marketed as Weedmaster. Appropriate use rates are based on numerous factors including forage species and age, weed species present, weed growth habit (annual,

biennial, perennial, woody), weed growth stage (seedling vs. regrowth after cutting, vegetative vs. reproductive, plant height, leaf stage), season of application (fall, dormant, spring, between cutting or grazing), over-seeding, grazing, or harvest considerations, and other factors. Some herbicides have a required waiting period between herbicide application and subsequent grazing or harvest (grazing and harvest restrictions). The length of time depends on the herbicides used and the animals being grazed or fed. You must wait the required time for the most restrictive herbicide applied. An additional rule of thumb is to wait the required time and resume grazing or harvest activities only if a half inch or more of rainfall has accumulated since the application. Otherwise, wait for a half inch of rainfall accumulation before grazing or harvest begins. Consult the herbicide label or a competent professional before making herbicide applications. Acceptable control of some species will require the use of alternate or additional herbicide active ingredients. Examples of species not effectively controlled with 2,4-D plus dicamba include bedstraw species, upright blackberry species, mouseear chickweed, dewberry species, honeysuckle species, kudzu, common mullein, multiflora rose, common pokeweed, sumac species, Canada thistle, trumpetcreeper, and many woody shrubs, vines, or trees.

### **Avoiding injury to non-target plants**

Sensitive non-target plants such as other crops, lawns, ornamental plants, and trees can be seriously injured or killed when herbicides are allowed to contact their leaves, stems, roots, or the soil in their rooting zone. Injured non-target plants can cause aesthetic or financial losses. Non-target plant injury is most commonly caused by pesticide drift or direct application to susceptible plant parts.

**Understanding pesticide drift** - Pesticide drift is simply the movement of a pesticide

through the air to an unintended (off-target) site. Drift can occur during or after application. **Physical drift** occurs during application when spray droplets are moved away with wind before reaching the intended spray target. Size of the spray droplets, travel distance to the target, relative humidity, and wind speed all influence how far spray droplets will drift. Spray droplets can drift from a few feet up to a few miles. All herbicides have the potential to move as physical drift. **Vapor drift** occurs only with certain herbicides, which can become volatilized (converted to a gaseous state) and move freely with the air. Volatilization can occur during or after the herbicide application. Volatilized herbicide vapor can travel up to several miles. For herbicides that are subject to volatility, the risk of volatility increases with increasing temperatures. Plant growth regulator herbicides such as Banvel, MCPA ester, or 2,4-D ester can be moderately volatile and should not be applied when daytime temperatures are expected to exceed 85F. How an herbicide is formulated also influences its potential to volatilize. Low volatile ester formulations of 2,4-D and MCPA are more volatile than amine formulations, and the dimethylamine salt of dicamba (Banvel) is slightly more volatile than the diglycolamine or sodium salts (Clarity or Overdrive).

**Injury from Drift** - Herbicide drift can cause serious injury to susceptible plants that come into contact with either spray particles or vapor. Most of the herbicides used in pasture and hay weed management have a moderate to high potential to injure sensitive plants. With highly sensitive plants like grape, tomato, and others, a very small amount of drifted herbicide can cause serious plant injury or death. The potential for injury can be minimized by knowing where sensitive plants are located and not spraying when conditions favor drift.

**Minimizing Drift** - Herbicide drift can be minimized by applying the appropriate herbicide(s) with a properly calibrated, equipped, and functioning sprayer while paying particular attention to environmental factors. Use low pressure spray tips that create coarse spray droplets. Maintain spray pressures at or below 20 to 30 psi and spray volumes above 20 gallons per acre (GPA) unless the herbicide label indicates otherwise. Maintain the boom height as close to the target as possible while maintaining proper spray pattern. Avoid herbicide applications during windy (more than 8 to 10 mph) or gusty conditions, during temperature inversions (see below), in foggy conditions, or when temperatures are high (>85F). Be certain even slight breezes are blowing away from highly sensitive plants, or leave an appropriate untreated buffer when spraying downwind from sensitive plants. Do not use mist-blower or fog type sprayers, like those used in orchards, vegetable production, or poultry houses to spray pasture or hay. Because backpack sprayers are more difficult to calibrate than field sprayers, over- or under-applications are more likely to occur, resulting in poor weed control or increased crop injury. Limit the use of backpack sprayers to small areas and spot spraying. Follow all the same precautions as with field sprayers. Always read herbicide labels. Many contain

important and often specific information concerning herbicide application and drift reduction procedures.

**Temperature inversions** restrict vertical air mixing which causes small suspended spray droplets to remain in a concentrated cloud. They are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and can continue into the morning. Ground fog may or may not be present. If ground fog is not present, they can be identified by the movement of smoke. During a temperature inversion, smoke from a ground source will layer and move laterally in a concentrated cloud. In the absence of a temperature inversion smoke will move rapidly upward and dissipate.

**Injury from direct application to susceptible plant parts** - Sensitive plants can be injured when spray accidentally contacts their leaves, stems, or exposed roots. Avoid spraying close to other crops or ornamental plantings, and avoid spraying within the drip line of sensitive trees both adjacent to and within a pasture. Areas too small to safely access with a field sprayer should be sprayed with a properly calibrated backpack sprayer.

### **Use of 2,4-D and dicamba for pasture weed control**

As mentioned previously, a combination of 2,4-D and dicamba is the standard herbicide treatment for controlling most broadleaf weeds in permanent grass pastures. Following are some considerations to help ensure safe, effective weed control with these products.

- Evaluate forage stand composition
  - Weeds + bare ground < 30% => herbicide + management = improved stand
  - Weeds + bare ground > 30 & < 50% => herbicide + over-seeding = improved stand
    - For spring applications over-seed in fall
    - For summer or fall applications over-seed next spring
  - Weeds + bare ground > 50% => renovation = improved stand
- Check weeds
  - Know the weed species present and which are controlled by 2,4-D + dicamba
  - Weed size is important. Best control is achieved when:
    - Weeds are actively growing (not dormant)

- Annual weeds are less than 4” tall
  - Biennial weeds are in the rosette stage
  - Perennial weeds are in the flower bud to flowering stage; time of year is dependent upon weed species present
- Check sprayer setup
  - Calibrate for spray volume of 20 gallons per acre or more
  - Equip with flat fan spray tips [extended range (XR), drift-guard (DG), turbo-teejet (TT), air induction extended range (AIXR), or other tips that create small droplets at low pressure]
  - maintain spray tip pressure at or below 20 to 30 psi
  - Set boom height 16 to 20” above weed height for 110 degree tips or 18 to 30 inches for 80 degree tips.
  - Do not use floodjet, hollow cone, or other type spray tips that create small droplets
  - Do not use mist-blower (orchard) or fog type sprayers
- Check sensitive plants
  - Identify non-target sensitive (broadleaf) plants in the area
    - Broadleaf crops such as beans, fruit trees, grapes, peas, potatoes, soybeans, sunflowers, tomatoes, and other vegetables
    - Ornamental plantings including flowers, roses, bushes, trees, etc.
  - When sensitive plants are nearby
    - Wait for appropriate environmental conditions to spray
    - Use amine salt formulations of 2,4-D
    - Use diglycolamine salt (Clarity) or sodium salt (Overdrive) of dicamba
    - Maintain setback from sensitive plants or drip-line of sensitive trees
  - When the amount or value of sensitive plants nearby is high, consider waiting until late fall or early spring (when sensitive plants are growing less actively) to spray.
- Check environmental conditions
  - Spray when anticipated high temperature <85F
  - Do not spray during extreme relative humidity (RH) conditions such as:
    - Low RH and high temperature conditions that favor rapid evaporation
    - Foggy conditions or temperature inversions
  - Check direction of any discernable wind (even slight breezes) relative to sensitive plants. Spray when breezes are blowing away from sensitive plants.
  - Do not spray when winds exceed 8 to 10 mph
  - Do not spray during gusty conditions
- Check Herbicide Labels
  - Follow all recommendations and restrictions on the herbicide labels.

More detailed information on weed management can be obtained from the “Pasture and Hay Weed Management Guide” for Delaware, Weed Fact 12. This publication is available at your local Cooperative Extension office or on-line at <http://www.rec.udel.edu/weedscience/>

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