

Control of Common Pasture and Hayfield Weeds in Virginia and West Virginia

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Horsenettle

Solanum carolinense



Spiny pigweed

Amaranthus spinosus



Canada thistle

Cirsium arvense



Bladder campion

Silene vulgaris



Stickweed

Verbesina occidentalis

Introduction

In Virginia and West Virginia, annual and perennial weed control in pastures and hayfields is an important aspect of successful forage management. This publication will discuss control measures for many of the common weeds found in Virginia and West Virginia permanent fescue and mixed fescue / bluegrass / orchardgrass pastures and hayfields. In mixed grass / legume pastures and hayfields, selective removal of many problematic weed species is often not possible as most legumes will be killed after applications of broadleaf herbicides. In mixed grass / legume pastures and hayfields, weed control can only be accomplished during establishment or renovation prior to seeding. Roundup or other glyphosate-containing products can provide control of most of the emerged grass and broadleaf weed species. Control of perennial weed regrowth or new weed flushes in newly established mixed grass / legume pastures and hayfields, however, is not possible. It is recommended that two years be allowed for the control of broadleaf weeds. Therefore, in fields where some of these weeds are expected to be problematic, reseed the grass but not the legume species for the first two years. After the weeds are under control, a legume species can then be planted.

Recently, the registration of two herbicides in Virginia and West Virginia has increased grower options for control of broadleaf weeds in pastures and hayfields. These two herbicides are Redeem R&P and Grazon P+D. Redeem R&P contains 2.25 and 0.75 lbs ai/gallon of triclopyr and clopyralid, respectively. Grazon P+D contains 0.24 and 2.0 lbs ai/gallon of picloram and 2,4-D, respectively. Grazon P+D is a restricted use herbicide and **is not labeled** for use in the West Virginia counties of Cabell, Jackson, Lincoln, Mason, Mineral, Putnam, Roane and Wirt. In Virginia, Grazon P+D **is labeled** in the counties shown in orange in Figure 1. These restrictions are due to the picloram content of Grazon P+D, which can cause injury to tobacco, tomatoes, grapes, and other sensitive broadleaf crops at very low concentrations. Because there are grazing and haying restrictions for both of these herbicides, be sure to follow label directions carefully.

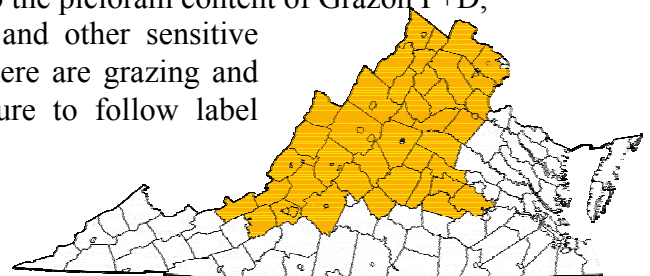


Figure 1.

Common Weeds and Their Control

Spiny pigweed: Spiny pigweed is a summer annual that is very similar in appearance to other pigweed species, but has spines along the stems. Spiny pigweed is primarily a weed of pastures and hayfields, and occurs less often in agronomic crops. Control of spiny pigweed is most effective when the plant is less than 2 inches tall. At this stage, spiny pigweed can be controlled with any of the herbicides listed in Table 1. However, control of spiny pigweed becomes more difficult as the size of the plant increases. The treatments described in Table 1 were applied to 6 to 8 inch spiny pigweed plants.

Table 1. Spiny pigweed Control

Herbicide	Rate product/acre	2 WAT ----- % Visual Control -----	8 WAT -----
Redeem R&P + Ally	1.0 pt + 0.2 oz	53 b	69 b
Redeem R&P + Ally	1.5 pt + 0.2 oz	62 a	82 ab
Redeem R&P + Ally	1.5 pt + 0.1 oz	60 ab	78 ab
Redeem R&P + Ally	2.0 pt + 0.2 oz	62 a	80 ab
Redeem R&P	2.0 pt	18 c	18 cd
Ally	0.1 oz	52 b	57 b
Ally	0.2 oz	60 a	87 a
Ally	0.3 oz	67 a	90 a
2,4-D + Ally	2 pt + 0.2 oz	67 a	85 ab
Pastureguard + Ally	2 pt + 0.2 oz	65 a	85 ab
Grazon P + D + Ally	2 pt + 0.2 oz	60 ab	87 a
Weedmaster	2 pt + 0.2 oz	28 c	28 c
Untreated	---	0 d	0 d
LSD (0.05)		10	18

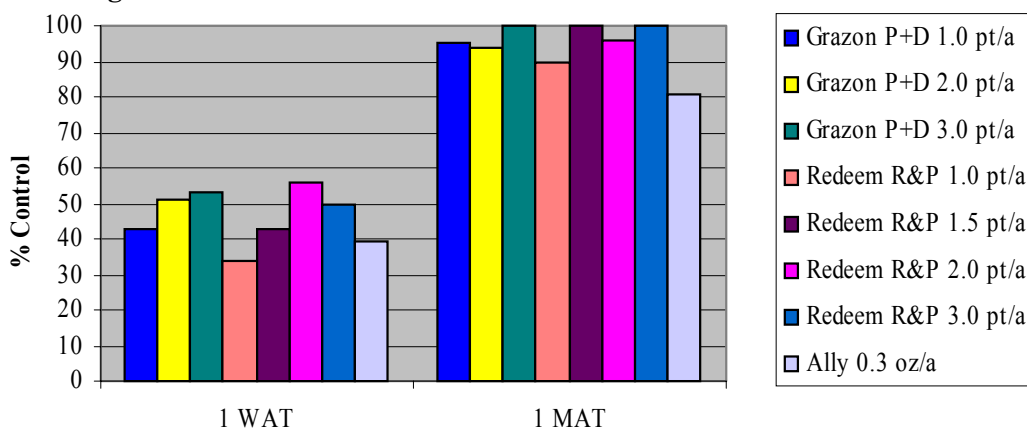
As illustrated in Table 1, at least 80% spiny pigweed control was achieved at 8 weeks after treatment (WAT) with 0.2 oz per acre of Ally in combination with 1.5 pints (pt) of Redeem R&P, 2 pt of 2,4-D, 2 pt of Grazon P+D, or 2 pt of Pastureguard. Ally, however, applied alone at 0.2 oz per acre controlled spiny pigweed 87% at 8 WAT. Redeem R&P applied alone at 2 pt per acre provided only 18% control at 8 WAT.

* Ally and Redeem applied with 0.5% v/v non-ionic surfactant

Canada thistle: Canada thistle is a perennial weed that spreads via rhizomes which grow 2 to 6 feet deep, and is a persistent weed of many pastures and hayfields. Both Grazon P+D and Redeem R&P controlled Canada thistle greater than 90% at 1 month after treatment (MAT) with rates of 1 pt per acre or greater (Figure 2). Ally, however, applied at 0.3 oz per acre controlled Canada thistle only 81% at 1 MAT. Grazon P+D and Redeem R&P are also effective for the control of other thistle species such as bull and musk thistle. For superior control of Canada thistle, herbicide treatments should be applied when plants are in the prebloom to early bloom stage of growth. For bull and musk thistle, treatments should be made when plants are in the rosette stage of growth.

Combinations of 2,4-D and Banvel provide approximately the same level of control of Canada thistle as Ally. Better long-term control of Canada thistle, however, is possible with Grazon P+D and Redeem R&P in comparison to other herbicides.

Figure 2. Canada Thistle Control



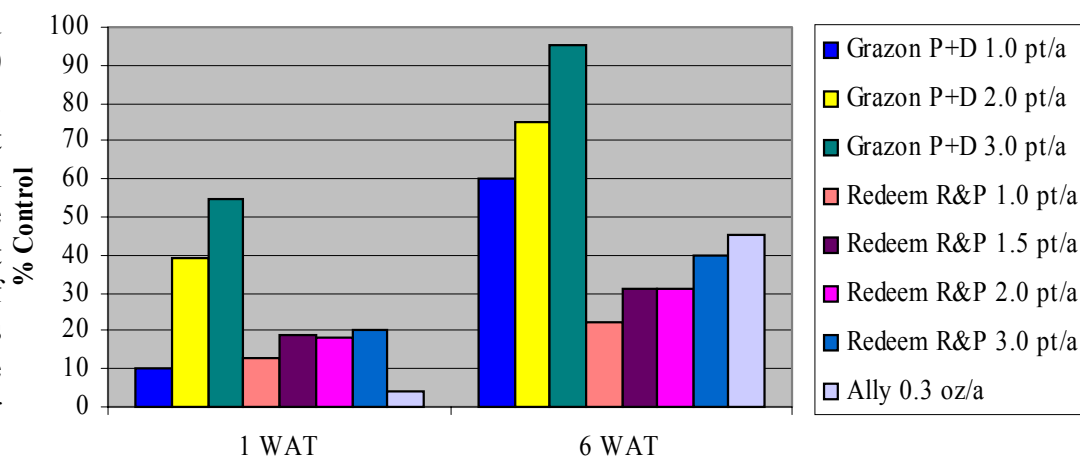
The combination of Redeem R&P and Ally would be very effective when pastures and hayfields contain infestations of both spiny pigweed and Canada thistle because of the control of Canada thistle provided by Redeem R&P (Figure 2), and the control of spiny pigweed afforded by Ally (Table 1).

Horsenettle: Horsenettle is an erect, perennial, broadleaf weed prevalent in pastures, meadows, and hayfields of Virginia and West Virginia. This weed is characterized by conspicuous spines that make it undesirable for consumption by cattle and other grazing animals. Horsenettle can reproduce from seeds that can persist in dry berries found in hay and from rhizomes or adventitious shoots that emerge from the creeping roots. A single plant can produce up to 5000 seeds. Therefore this persistent plant can take over entire fields if not managed.

In research conducted in Virginia, Grazon P+D at 3 pt per acre controlled horsenettle 95% at 6 WAT (Figure 3). Similar results have been observed in West Virginia where 2 to 3 pt of Grazon P+D

applied to horsenettle at the prebloom to bloom stage provided control between 80 and 90%. Previously, horsenettle control at this level has not been economically feasible in Virginia and West Virginia because of the high rates necessary to achieve control with the other available herbicides.

Figure 3. Horsenettle Control in Virginia 2002



Redeem R&P and Ally applied at 3 pt and 0.3 oz per acre, respectively, provided less than 50% control of horsenettle at 6 WAT.

Stickweed: Stickweed, also known as yellow crownbeard, is a perennial weed that may reach as much as 13 feet in height. Mature plants have showy yellow flowers and ‘wings’ that run along the length of the stem. Stickweed is a weed of pastures, hayfields, fencerows, roadsides, and rights-of-way.

Stickweed was controlled 93% and 83% in 2001 and 2002, respectively, with 2 pt per acre of Grazon P+D (Table 2). However, at least 3 pt of Redeem R&P per acre were required to achieve this same level of stickweed control.

Table 2. Stickweed Control

Herbicide ^a	Rate/A	2001	2002
----- % Visual Control 5 MAT ^b -----			
2, 4-D Ester	1 qt	80	76
2, 4-D Ester + Banvel	1 qt + 1 pt	67	83
Banvel	1 pt	45	38
Grazon P+D	1 pt	60	64
Grazon P+D	2 pt	93	83
Grazon P+D	3 pt	97	93
Grazon P+D	4 pt	100	96
Redeem R&P ^c	1.5 pt	63	55
Redeem R&P ^c	2 pt	75	74
Redeem R&P ^c	3 pt	90	83
Redeem R&P ^c	4 pt	88	88
Ally ^c	0.3 oz	45	2
Crossbow	2 qts	67	76
Untreated	---	0	0
LSD (0.05)		16	13

^a Applications made to stickweed ranging from 4 to 12 inches in height.

^b 5 MAT = months after treatment

^c Applied with non-ionic surfactant at 0.50% (v/v).

Stickweed control with 4 Pt Grazon P+D: 2 MAT



Stickweed Continued: Crossbow, 2,4-D alone, or 2,4-D in combination with Banvel generally controlled stickweed between 67 and 83%. Banvel alone or Ally, however, resulted in less than 50% stickweed control.

Wild carrot, Broadleaf and Buckhorn plantain, Poison-ivy and Bladder campion: These biennial and perennial weeds are often common, difficult to control weeds in pastures and hayfields in Virginia and West Virginia. One quart of 2,4-D alone or in combination with Banvel controlled both plantain species greater than 90% (Table 3). The other weed species in Table 3, however, were not adequately controlled with 2,4-D alone or in combination with Banvel. Effective control of wild carrot and the two plantain species was accomplished with Grazon P+D and Redeem R&P at rates of 2 to 4 pints per acre and 3 to 4 pt per acre, respectively. Poison-ivy control of 70% or greater was provided by: 2,4-D in combination with Banvel, 3 to 4 pt per acre of Grazon P+D, and 4 pt per acre of Redeem R&P.

Bladder campion, which is becoming more prevalent in Virginia, is a very difficult to control weed in pastures and hayfields. The highest level of control of bladder campion was observed with 0.3 oz of Ally per acre. Bladder campion control with Ally, however, was only 66%. The use of the other herbicides typically resulted in 59% or less control.

Table 3. Biennial and Perennial Weed Control

Treatment	Rate product/A	Weed Species				
		Wild carrot	Broadleaf plantain	Buckhorn plantain	Poison- ivy	Bladder campion
		----- % Control (End of Season) -----				
2, 4-D Amine	1 qt	59 c	94 ab	95 a	16 e	8 hi
Banvel	1 pt	30 d	36 c	38 c	20 e	9 ghi
2, 4-D + Banvel	1 qt + 1 pt	61 c	96 ab	96 a	71 ab	19 efg
Grazon P+D	1 pt	73 bc	93 ab	93 a	15 e	14 fgh
Grazon P+D	2 pt	100 a	100 a	100 a	41 d	34 cd
Grazon P+D	3 pt	100 a	98 a	100 a	75 ab	35 bcd
Grazon P+D	4 pt	99 a	99 a	99 a	83 a	59 a
Redeem R & P ^a	1.5 pt	70 bc	46 c	48 b	28 e	24 def
Redeem R & P ^a	2 pt	80 b	85 b	91 a	25 e	33 cd
Redeem R & P ^a	3 pt	100 a	91 ab	95 a	53 cd	35 bcd
Redeem R & P ^a	4 pt	100 a	96 ab	98 a	71 ab	41 bc
Crossbow	2 qt	70 bc	94 ab	93 a	61 bc	43 bc
Ally ^a	0.3 oz	70 bc	90 ab	90 a	18 e	66 a
Untreated	----	0 g	0 d	0 d	0 f	0 I
LSD (0.05):	----	13	11	9	13	10

^aApplied with non-ionic surfactant at 0.5% v/v.

Conclusions: Most of the weeds discussed in this publication are difficult to control in pasture and hayfield situations. Superior control of certain weeds often requires a specific herbicide choice. Care must be taken to match the weed species and weed size with the herbicide and rate needed for effective control. Repeat applications are often necessary to provide long-term control of some of these weed species. Weed control with herbicides alone often results in reinfestation of the pasture or hayfield. Long-term weed control must utilize herbicides in combination with a healthy, dense forage that can successfully compete with the weeds of pastures and hayfields. Please utilize your state's Extension Service if you have any concerns, and feel free to consult Virginia Tech's on-line weed ID site to help in the correct identification of a particular weed species.

The Virginia Tech Weed ID website is located at: <http://www.ppws.vt.edu/weedindex.htm>