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

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Horsenettle
Solanum carolinese

Spiny pigweed
Amaranthus spinosus

Canada thistle
Cirsium arvense

Bladder campion
Silene vulgaris

Stickweed
Verbesina occidentalis

Introduction

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 2 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 2 years. After the weeds are under control, a legume species can be planted.

Recently, the registration of two herbicides in Virginia and West Virginia has increased grower options for the 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 pounds ai per gallon of triclopyr and clopyralid, respectively. Grazon P+D contains 0.24 and 2.0 pounds ai per 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** for use in the counties shown in orange in Figure 1. These restrictions are due to the picloram content of Grazon P+D, which can

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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.

Common Weeds and Their Control

Spiny pigweed

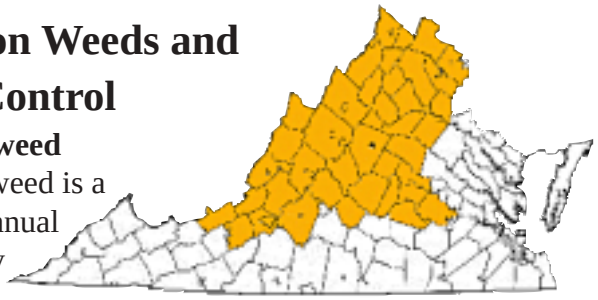


Figure 1

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

Canada thistle

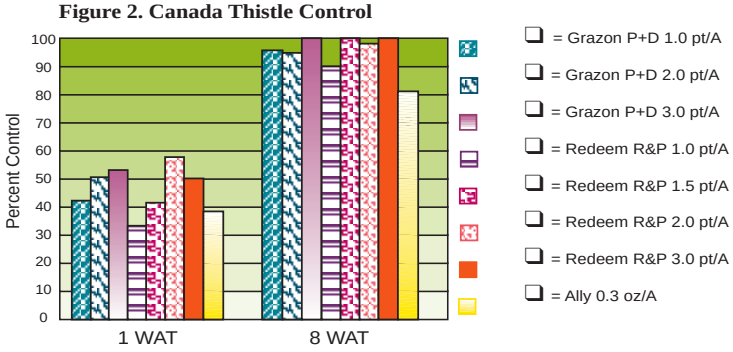
Canada thistle is a perennial weed that spreads via rhizomes that grow 2 to 6 feet deep and is a persistent weed in many pastures and hayfields. Both Grazon P+D and Redeem R&P controlled Canada thistle greater than 90 percent at 1 month after treatment (MAT) with rates of 1 pint per acre or greater (Figure 2). Ally, however, applied at 0.3 ounce per acre controlled Canada thistle only 81 percent 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 thistles. 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 thistles, 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. 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 Canada thistle control provided by Redeem R&P (Figure 2), and the spiny pigweed control afforded by Ally (Table 1).

Table 1. Spiny pigweed Control

Herbicide	Rate product/acre	2WAT % Visual Control	8 WAT % Visual Control
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	70 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	80 a
Weedmaster	2 pt + 0.2 oz	28 c	28 c
Untreaded	–	0d	0d
LSD (0.05)		10	18

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

Figure 2. Canada Thistle Control

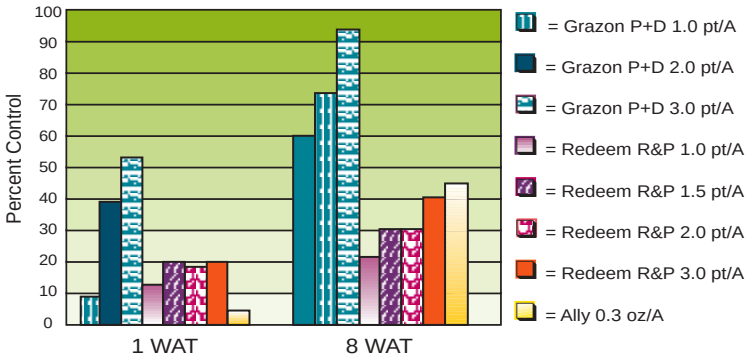


Horsenettle

Horsenettle is an erect, perennial, broadleaf weed prevalent in the 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 5,000 seeds. Therefore this persistent plant can take over entire fields if not managed.

In research conducted in Virginia, Grazon P+D at 3 pints per acre controlled horsenettle 95 percent at 6 WAT (Figure 3). Similar results have been observed in West Virginia where 2 to 3 pints per acre of Grazon P+D applied to horsenettle at the prebloom to bloom stage provided control between 80 and 90 percent. 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. Redeem R&P and Ally applied at 3 pints and 0.3 ounce per acre, respectively, provided less than 50 percent control of horsenettle at 6 WAT.

Figure 3. Horsenettle Control in Virginia 2002



Stickweed

Stickweed, also known as yellow crownbeard, is a perennial weed that may grow as high as 13 feet. 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 percent and 83 percent in 2001 and 2002, respectively, with 2 pints per acre of Grazon P+D (Table 2). However, at least 3 pints of Redeem R&P per acre were required to achieve this same level of stickweed control. Crossbow, 2,4-D alone, or 2,4-D in combination with Banvel generally controlled stickweed between 67 and 83 percent. However, using Banvel alone or Ally resulted in less than 50 percent stickweed control.

Table 2. Stickweed Control

Herbicide[1]	Rate/A	2001	2002
		% Visual Control 5 MAT[2]	
2,4-D Ester	1.0 qt	80	76
2,4-D Ester + Banvel	1.0 qt + 1.0 pt	67	83
Banvel	1.0 pt	45	38
Grazon P+D	1.0 pt	60	64
Grazon P+D	2.0 pt	93	83
Grazon P+D	3.0 pt	97	93
Grazon P+D	4.0 pt	100	96
Redeem R&P[3]	1.5 pt	63	55
Redeem R&P[3]	2.0 pt	75	74
Redeem R&P[3]	3.0 pt	90	83
Redeem R&P[3]	4.0 pt	88	88
Ally[3]	0.3 oz	45	2
Crossbow	2.0 qt	67	76
Untreated	—	0	0
LSD (0.05)	—	16	13

[1] Applications made to stickweed ranging from 4 to 12 inches in height

[2] 5 MAT = months after treatment

[3] Applied with non ionic surfactant at 0.50% (v/v)


Stickweed control with 4 pts of Grazon P+D: 2 MAT

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 per acre of 2,4-D alone or in combination with Banvel controlled both plantain species greater than 90 percent (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 pints per acre, respectively. Poison-ivy control of 70 percent or greater was provided by: 2,4-D in combination with Banvel, 3 to 4 pints per acre of Grazon P+D, and 4 pints per acre of Redeem R&P.

Bladder campion, which is becoming more prevalent in Virginia, is very difficult to control in pastures and hayfields. The highest level of control of bladder campion was observed with 0.3 ounce of Ally per acre. Bladder campion control with Ally, however, was only 66 percent. The use of the other herbicides typically resulted in 59 percent 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	1.0 qt	59 c	94 ab	95 a	16 e	8 hi
Banvel	1.0 pt	30 d	36 c	38 d	20 e	9 ghi
2,4-D + Banvel	1.0 qt + 1 .0 pt	61 c	96 ab	96 a	71 ab	19 efg
Grazon P&D	1.0 pt	73 bc	93 ab	93 a	15 e	14 fgh
Grazon P&D	2.0 pt	100 a	100 a	100 a	41 d	34 cd
Grazon P&D	3.0 pt	100 a	98 a	100 a	75 ab	35 bcd
Grazon P&D	4.0 pt	99 a	99 a	99 a	83 a	58 a
Redeem R&P[1]	1.5 pt	70 bc	46 c	48 b	28 e	24 def
Redeem R&P[1]	2.0 pt	80 b	85 b	91 a	25 e	33 cd
Redeem R&P[1]	3.0 pt	100 a	91 ab	95 a	53 cd	35 bcd
Redeem R&P[1]	4.0 pt	100 a	96 ab	98 a	71 ab	41 bc
Crossbow	2.0 qt	70 bc	94 ab	93 a	61 bc	43 bc
Ally[1]	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

[1] Applied 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 the 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 system if you have any concerns, and feel free to consult Virginia Tech'sWeed Identification Guide at http://www.ppws.vt.edu/weedindex.htm to help correctly identify a particular weed species.

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