

MILESTONE™ HERBICIDE (AMINOPYRALID): NEW EFFICACY RESEARCH ON NOXIOUS AND INVASIVE WEEDS

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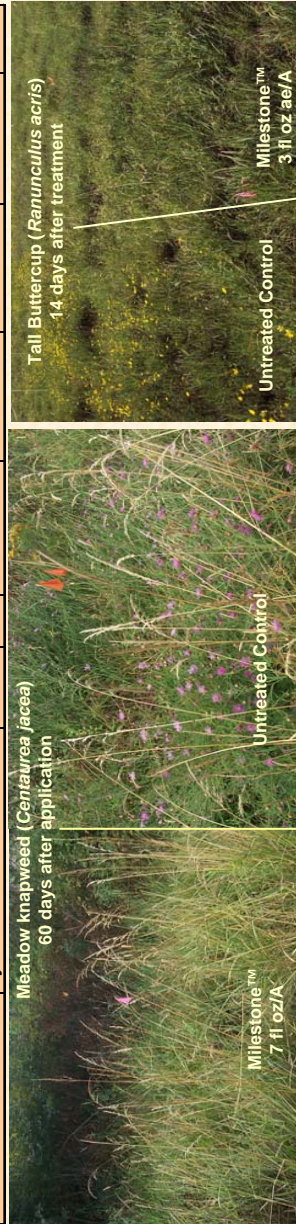
TABLE 1. Percent Control with Various Rates of Milestone™ (aminopyralid) on Target Weed Species

| Common name | Scientific name | Bayer Code | DAA | Milestone | | % Control | | Application timing | State |
|------------------------|------------------------------|------------|-----|--------------------------|--------------------------|------------------------------------|------------------------------------|--------------------|-------|
| | | | | 0.75 oz ae/A (3 fl oz/A) | 1.25 oz ae/A (5 fl oz/A) | Milestone 1.75 oz ae/A (7 fl oz/A) | Milestone 1.75 oz ae/A (7 fl oz/A) | | |
| Meadow knapweed | <i>Centaurea jacea</i> | CENJA | 379 | NA | 80 | 99 | 99 | 05-May-05 | OR |
| Woolly distaff thistle | <i>Carthamus lanatus</i> | CAULA | 378 | 92 | 100 | 100 | 100 | 06-Apr-05 | CA |
| Italian thistle | <i>Carduus pycnocephalus</i> | CRUPY | 378 | 47 | 48 | 80 | 80 | 06-Apr-05 | CA |
| Tall buttercup | <i>Ranunculus acris</i> | RANAC | 363 | 88 | 100 | 100 | 100 | 08-Jun-05 | MT |
| St. Johnswort | <i>Hypericum perforatum</i> | HYPPE | 352 | 65 | 87 | 99 | 99 | 05-Jul-05 | WA |
| Rush skeletonweed | <i>Chondrilla juncea</i> | CHOJU | 283 | 75 | 92 | 95 | 95 | 08-Nov-05 | WA |
| Artichoke thistle | <i>Cynara cardunculus</i> | CYUCA | 117 | 82 | 77 | 92 | 92 | 13-Jan-06 | CA |
| Purple starthistle | <i>Centaurea calcitrapa</i> | CENCA | 113 | 98 | 99 | 100 | 100 | 27-Mar-06 | CA |
| Scotch thistle | <i>Onopordum acanthium</i> | ONRAC | 112 | 98 | 99 (2 reps) | 99 | 99 | 05-May-05 | NE |
| Mullein | <i>Verbascum thapsus</i> | VESTH | 100 | NA | 85 (4 fl oz/A) | 96 | 96 | 05-Jun-06 | SD |
| Artichoke thistle | <i>Cynara cardunculus</i> | CYUCA | 47 | 93 | 88 | 99 | 99 | 24-Mar-06 | CA |

Introduction
Aminopyralid is a new pyridine carboxylic acid herbicide intended for use in rangelands, pastures, Conservation Reserve Program (CRP), and industrial vegetation management areas, including rights-of-way for roads, railroads and electric utility lines. This Dow AgroSciences herbicide was designed and developed specifically for the control of noxious and invasive weed species on non-cropland sites. Aminopyralid is a new generation active ingredient that is effective at very low rates as compared to currently registered herbicides with the same mode of action, including 2,4-D, clopyralid, triclopyr, picloram and dicamba. Aminopyralid is a broadleaf weed herbicide that provides systemic, postemergence control of noxious and invasive annual, biennial and perennial weed species, agronomically important weeds and certain semi-woody plants. Aminopyralid can provide residual control thus reducing the need for re-treatment, depending on the rate applied and the target weeds. Currently aminopyralid is registered as Milestone™, Milestone VM, and ForeFront™ R&P (premix with 2,4-D).

Materials and Methods

Multiple research trials were initiated in 2005 and 2006 on non-cropland sites in California, Idaho, Montana, Nebraska, Oregon, South Dakota, and Washington. Studies were conducted as small, replicated trials with Milestone at 3, 5, and 7 fl oz product/A, 3 to 4 replications in a randomized complete block design, applied with CO₂ backpack sprayers, and using spray volumes of 15 to 44 GPA. Treatments were applied with the addition of a non-ionic surfactant at 0.25% v/v. Plots were evaluated at 47 to 379 days after application for percent visual control. Trials were established to assess mullein (*Verbascum thapsus*), Scotch thistle (*Onopordum acanthium*), purple starthistle (*Centaurea calcitrapa*), rush skeletonweed (*Chondrilla juncea*), St. Johnswort (*Hypericum perforatum*), meadow knapweed (*Centaurea jacea*), tall buttercup (*Ranunculus acris*), and Italian (*Carduus pycnocephalus*), woolly distaff (*Carthamus lanatus*), artichoke (*Cynara cardunculus*) and Scotch (*Onopordum acanthium*) thistles responses to aminopyralid.



Results

Milestone at 5 and 7 fl oz/A provided excellent control of woolly distaff thistle (100/100%), rush skeletonweed (92/95%), St. Johnswort (87/99%), and tall buttercup (100/100%) 1 year after application (Table 1). Milestone at 7 fl oz/A controlled meadow knapweed (99%), artichoke thistle (92%), and Italian thistle (80%) at 1 year after application. Within the growing season of application Milestone provided excellent control of purple starthistle (≥95%) and Scotch thistle at 3 fl oz/A or more and common mullein (85/96%) at 4 and 7 fl oz/A, respectively.

Summary

Milestone was registered by the US EPA in October 2005. Forty-eight weed species, including Canada thistle (*Cirsium arvense*), spotted knapweed (*Centaurea maculosa*), Russian knapweed (*Acroptilon repens*), yellow starthistle (*Centaurea solstitialis*), musk (*Carduus nutans*) and bull (*Cirsium vulgare*) thistles, and orange and yellow hawkweeds (*Hieracium aurantiacum* and *H. caespitosum*) were listed on the label. Field trials have been conducted since the registration of Milestone to determine efficacy on other weeds. The new weeds controlled by Milestone include meadow knapweed, woolly distaff and Italian thistle, tall buttercup, St. Johnswort, rush, skeletonweed, Scotch and artichoke thistles, purple starthistle, and mullein. A total of 24 new weed species were added to the latest revision of the Milestone label that was accepted by EPA in January 2007.



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