The Latest Tools in Herbicide Technology & Extending Labels for Invasives

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"... the market for chemical herbicides used on rangeland and grazing pastures expanded by more than 30% from 2001 to 2003... directly related to a greater awareness of the invasive weed and brush problem that has been worsening for several years."

Kline 2004. The U.S. Industrial vegetation management market for pesticides and fertilizers
**Herbicides for Invasives**

- **Chinese tallow** - Velpar L and Krenite S
- **Japanese honeysuckle** - Escort XP, Oust Extra, Velpar L
- **Multiflora Rose** - Escort XP, Oust Extra, Velpar L
- **Sericea Lespedeza** - Escort XP
- **Purple loosestrife** - Escort XP
- **Old World climbing fern** - Escort XP
- **Ailanthus** - Escort XP
- **Privet** - Velpar L

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**NATIVE GRASSES**

ESCORT® XP is recommended for weed control and maintenance of native grasses. It may be used where blue gram, bluebells (bag, little, plains, sand, weedy spars), bromegrass (meadow), buffalograss, green spangletop, indiangrass, littlegrass, lovegrasses (atherstone, sand, weeping, vilma), orchardgrass, sedobleau, grama, switchgrass (blackwell), wheatgrass (bluebush, intermediate, pubescent Siberian, slender, streambend, tall, thackspike, western), and Russian wildrye are established. It may also be applied over these species in the seedling stage, except for orchardgrass and Russian wildrye.

**Application Information**

Apply ESCORT® XP at the rate of 1/10 ounce per acre for the control and suppression of buttercup (testiculate).
R & D program to evaluate product performance on exotic species in the Southeast

- Japanese stiltgrass (Microstegium)
- Chinese privet
- Eleagnus spp.
- Bush honeysuckles
- Mimosas
- Garlic mustard
- Brazilian pepper
- Japanese climbing fern

Garlon 3A is approved for use in and around aquatic sites in forests, non-crop areas, ditches, wildlife management. May be used in and around standing water such as ponds, lakes, marshes.

For application to control floating and submerged weeds in lakes and ponds, the same active ingredient is available under the trade name Renovate from SePro.
**Garlon 4** - may be used on almost any site with invasives, used mainly as a basal spray, but is also good for foliar application.

**Garlon 4** - may be used in non-irrigation ditchbanks, seasonally dry wetlands, flood plains, marshes, swamps, bogs, and transitional areas between upland and lowland sites. Do not apply to open water such as lakes, rivers, creeks, bays.

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**Accord Concentrate**

- There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.
- Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.

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**Accord XRT**

- New terrestrial formulation
- 5.4 #s active + surfactant. This formulation contains enough surfactant for most uses. Most concentrated formulation available.
- Labeled for Forests, Parks, Natural areas, wildlife refuges, recreation areas, non-crop area, habitat management, and similar sites.

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**Other Dow Products for Invasives**

- **Spike** - Potent long term vine, brush and tree control. Herbaceous vegetation will cover the site in 6 months to 1 year.
- **Transline** – Very specific formulation for legumes, composites, and a few other weeds
- **Tordon** – Excellent on kudzu, wisteria, and many other invasive vines, brush, and tree species.

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**Aminopyralid**

**A New Herbicide from Dow AgroSciences**

Developed specifically for range, pasture and vegetative management broadleaf weed control including noxious and invasive plants.

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Invasive Weeds

The Problem

• Highly effective on invasive weeds like Canada thistle, yardgrass, knotweed, knotgrass, southern meadow foxtail, Russian thistle, and tangle-apple
• Excellent for broadleaf and 40 days
• Highly effective on invasive weeds like Canada thistle, yardgrass, knotweed, knotgrass, southern meadow foxtail, Russian thistle, and tangle-apple

The Solution

• Plateau

Weed Database

BASF offers tools and expertise to win the battle against the most troublesome invasive weeds. For weed control recommendations, you can search by class of weed, common name, scientific name or any keyword.
Herbicide Registration

- Standardized procedure to ensure product safety
- Defines hazards
  - What is the toxicity?
  - What are the non-target impacts?
  - How does the product breakdown?
  - How is it used and handled?

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Herbicide Registration

- Section 3: Full Federal Use Label
  - Experimental Use Permit (EUP)
    - Only approved after significant development completed
    - Increases acreage that can be treated for data collection
- Section 18: Emergency Use Label*
  - State specific
- Section 24-C: Special Local Need*
  - State specific

* Initiated by states

Jim Bean, BASF

Registrar & Sites

- Crop
- Non-crop
  - Terrestrial
  - Aquatic
  - Forestry
  - Pasture / Range

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Development & Registration

Section 3: Terrestrial sites
- Over 120 studies
- 14 years
- $140 Million

Note: Aquatic, Forestry, Pasture / Range sites require additional testing

Jim Bean, BASF

Label Enhancements/Amendments

- New weeds & crops
- New application methods
- New restrictions
- Required regulatory language (WPS, Drift, Weed resistance management)
- All changes must be approved by EPA
  - 3 - 6 months time frame

Jim Bean, BASF

State Registrations

- Annual fee for each product
- New products and uses must be approved by each state
- Requirements vary by state
  - Most extensive: CA, NY, FL, AZ

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New Invasive Species Listing

• Identify site(s) where the new invasive species grows
• REMEMBER: Products are labeled by site!
• Establish product efficacy
• Review list of sites on existing product label

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Scenario #1
• Site is listed on existing product label
• Applications OK

Scenario #2
• Site is not listed on existing product label
• Apply for Section 18: Emergency Use Exemption
• State(s) must initiate request

Jim Bean, BASF

Aminopyralid Characteristics

• Target registration date of Q4 2005
• Controls noxious and invasive plants, and other undesirable broadleaf weeds in rangeland, pastures and roadsides
• Selective to most cool- and warm-season perennial rangeland, pasture and IVM grasses
• Label submitted carries no grazing or haying restrictions for dairy and non-dairy animals
• Accepted for review under U.S. EPA’s Reduced Risk Pesticide initiative

Aminopyralid Acute Toxicology Profile

No acute hazard – “CAUTION” signal word anticipated

<table>
<thead>
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<th>Study</th>
<th>LD₅₀ neat (%)</th>
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<tbody>
<tr>
<td>Acute Oral</td>
<td>&gt;5000 mg/kg</td>
</tr>
<tr>
<td>Acute Dermal</td>
<td>&gt;5000 mg/kg</td>
</tr>
<tr>
<td>Acute Inhalation</td>
<td>&gt;5.79 mg/L</td>
</tr>
<tr>
<td>Eye Irritation</td>
<td>Mild Irritant</td>
</tr>
<tr>
<td>Dermal Irritation</td>
<td>Slight Irritant</td>
</tr>
<tr>
<td>Dermal Sensitization</td>
<td>Negative</td>
</tr>
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</table>

Aminopyralid Mammalian Chronic Toxicity Profile

Based on laboratory studies no significant adverse effects, including:
  – No reproductive or endocrine effects.
  – No developmental effects.
  – No genotoxicity.
  – No neurotoxicity.
  – No carcinogenicity.

Aminopyralid Ecotoxicology Review

Based on laboratory studies Aminopyralid is practically non-toxic to:
  - Birds: bobwhite quail, mallard ducks
  - Fish: rainbow trout, bluegill sunfish, sheepshead minnow, fathead minnow
Aminopyralid Ecotoxicology Review

**ECOTOX PROFILE**

- In laboratory studies aminopyralid exhibited low acute and chronic toxicity to mammals, birds, fish, aquatic and terrestrial invertebrates, algae and aquatic vascular plants.
- Risk of adverse effects is substantially below all of the EPA levels of concern (LOC) for non-target organisms.
- Studies show that aminopyralid produces no significant soil or water metabolites other than CO2 and NH3 and has a low bioaccumulation potential.

**Toxicology Summary**

- **Environmental Toxicology:**
  - Practically non-toxic to birds, fish, honeybees, earthworms, and aquatic invertebrates.
- **Acute Mammalian Toxicity:**
  - Low acute mammalian toxicity.
  - Caution as the label signal word anticipated.
- **Chronic Mammalian Toxicity:**
  - Not carcinogenic or mutagenic.
  - Does not cause birth defects (not teratogenic).
  - Causes no neurological problems.
  - Does not cause any endocrine or adverse reproductive effects.

**Environmental Fate**

- **Soil**
  - Aerobic microbial degradation is the primary route of breakdown in soil.
  - Moderate soil half-life of about 30 days.
  - Limited movement in the soil profile.
  - No degradation metabolites of concern.
- **Water**
  - Photolysis is primary route of degradation, with a half-life under standard conditions of 0.6 days.
  - Groundwater contamination potential is low because of low use rates combined with moderate field degradation rates.
- **Air**
  - Low vapor pressure reduces potential for volatility.

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