

Montana Agricultural Experiment Station Integrated Weed Management and Biotechnology

State Need:

- As part of the Montana Weed Management Plan, research is sorely needed on integrated weed management practices and biocontrol options on rangelands and croplands. Montana needs to be a world class leader in weed research.
- Animal and plant biotechnology research will add value to livestock and plant systems which will enhance the current \$2 billion cash receipts from agriculture.

Market Reality:

- Land managers are continually seeking single and multiple approaches to contain, control and, possibly, eradicate noxious weeds. Chemical, mechanical, biological, reseeding and other practices may have potential use in different combinations specific to a site.
- Biotechnology is a key futuristic tool that can add value to animal and plant enterprises throughout Montana.

Current Problem:

- As one example, knapweed is conservatively estimated to cause \$14 million in direct negative impacts (reduced grazing capacity, degraded wildlife habitat) and \$28 million in indirect impacts (aesthetic, plant diversity) in Montana. Weed control efforts are a long-term proposition, costly and require integrated management.
- Production efficiencies and optimum management practices have been pushed to the limit in the green revolution. Montana needs to actively participate in the next leap, the gene revolution of enhanced quality traits.

Proposed Solution:

- Fill two vacant weed science positions, one in integrated weed management practices on rangeland and forested lands, and a second one in biological control (disease and insect) for cropland and rangeland weeds.
- A position in either animal or plant biotechnology to apply molecular genetic tools to improve the quality of animal and plant products.

Required Investment:

- 06 \$239,950 Three positions at \$79,983 (salary at \$60,000 plus associated benefits)
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- Historically several state agencies, federal agencies, local weed control districts and chemical companies have provided funding for weed control research at MAES. A partial list of state and federal agencies and chemical companies is provided below.
- State Agencies: The Montana Noxious Weed Trust Fund, the Montana Department of Agriculture, The Montana Wheat and Barley Committee and Montana Board of Research & Commercialization.
 - Federal agencies: United States Department of Agriculture-Cooperative States Research and Extension Service has provided funding for the Center for Invasive Plant Management, in addition numerous other grants in different areas of weed research, National Park Service, USDA Forest Service, USDA Agriculture Research Service and the Bureau of Land Management.

- Chemical companies contributing to MAES weed research include, but not limited to, Monsanto, BASF, FMC, Arvesta, Bayer Crop Science, Snygenta, EI DuPont and Bush Ag.
- Other: Missoula County Weed District, Sanders County, Townsend Ranger District and Dull Knife College.

Partnerships for the third position, a molecular scientist either plant or animal would include the Montana Stockgrowers, USDA Agriculture Research Service, the seedstock industry, Montana ranchers and the genetic industry.

Selected Examples of Return:

- Implementation of cost-effective weed management practices increases net returns that in turn, multiply through these basic industries.
- Increased tenderness in beef or increased protein in wheat would generate additional income due to enhanced quality.