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Role of biocontrol agents in the management of weeds¹

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Discussion centered around the need for more and more effective biocontrol agents. Various ranchers pointed out the high cost of chemical control, the necessity for repeated applications, the sometimes inability of chemicals to provide complete control and the possible detrimental effect of long term chemical use on the land, as reasons. As expressed by Dwane Woolworth, “we must take a stewardship of the land; we have an obligation to hand down the land to the next generation in better condition than we received it.”

Dr. Harold Alley correctly pointed out that had chemicals been applied to small patches of leafy spurge as they appeared, we would not now be faced with the necessity of attempting to control leafy spurge on over a million acres. He noted that it has been possible with judicious use of chemicals to contain the 40,000 acre infestation in Wyoming. While in individual instances the cost of control of spurge can exceed the original cost of the land, by extrapolation the cost per acre would only be \$7.50 if one assumes that uncontrolled the 40,000 acres would in six years have expanded to one million. As he correctly points out, we cannot wait for biocontrol agents.

However, since we are now faced with a major leafy spurge range expansion, it behooves us to consider other ways to control this weed. Biocontrol is certainly one promising path. In this regard, the primary concern expressed by the group was that biocontrol agents were not becoming available as fast as everyone would like. As Dr. Warren Shaw (USDA) correctly pointed out there is an established protocol for the release of bioagents which is consistent with the concept of safe release so as not to endanger plants of economic importance.

Several people expressed the concern that maybe we are putting a little too much emphasis on the potential conflict of the natural enemies with native plants, and thus perhaps unnecessarily reducing the list of promising natural enemies and retarding the rate at which new control agents are released. Dr. Nowierski pointed out that the displacement and elimination of native plants by the weed itself and herbicide impact on native plants are also important issues that need to be considered.

¹ Some pertinent comments have also been added from the general discussions throughout the symposium.

Discussion proceeded on what levels of risk should be taken as it relates to the use of biocontrol agents. How much economic loss are we prepared to take while we wait for bioagents to become effective? Concern was also expressed that potential bioagents, once released, would not only control the weed, but would wipe out related native plants which might be of marginal economic importance, have aesthetic value, or have long term potential as a genetic pool. As was correctly pointed out by Dr. Nowierski, one of the basic premises of the use of bioagents is that a natural enemy never completely eliminates its host. Thus one sees the reduction of the host followed by a population crash of the bioagent and then a subsequent regeneration of the host with another population explosion of the bioagents, i.e., a cyclical phenomenon. It was pointed out that a program of education was needed to propagate this idea, and reduce concerns for the environment expressed by many people. Dr. Nowierski pointed out that the level of risk one can afford for natural enemies attacking native plants or other desirable flora should probably be based on the economic damage caused by the weed, weighed against any beneficial attributes the weed may possess (such as providing nectar and pollen to honey bees) and the number of native and/or economically important plants in potential conflict. More risk (that a natural enemy may attack a native plant or other desirable flora) may have to be tolerated for a severely damaging weed on marginal economic land, where conventional control is too expensive or impossible to implement.

Because of the genetic plasticity of leafy spurge, there is obviously no single answer to the problem. As was correctly pointed out by several individuals, a multiple (Integrated Pest Management) approach is a necessity consisting of chemical, cultural, biological and mechanical control. In this regard, it is obviously necessary that we know our enemy, thus the emphasis on taxonomy and cytogenetics of the spurge complex. It was pointed out that the best approach was multiple stress on the weed.

Concern was then expressed, that where leafy spurge had been controlled, secondary problems could arise. Mr. Stephenson pointed out that flooding and erosion along the Heart River would ensue if leafy spurge were controlled there. In other locations, other weeds have invaded the areas left clear by dead spurge plants. As was pointed out by Lavigne, the solution might be to utilize a grass seeding program to restabilize the environment.

Whatever, the direction taken for the control of leafy spurge, one thing is certain – as pointed out by Mr. Lentsch, ranchers cannot afford to pay the high costs of chemical control for the next 20 years in light of the reduced consumption of beef and concurrent low beef prices.