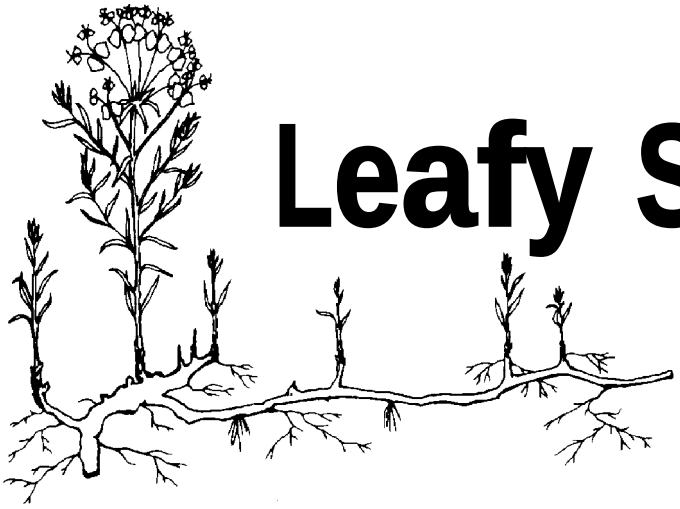


Leafy Spurge *News*

Agricultural Experiment Station
NDSU Extension Service
North Dakota State University, Fargo, ND 58105

Volume XX, Issue 4 November 1998

From The Editors Desk

Your editor has just up-graded his computer, from a 486 to an HP 6330 with Windows 98, and the learning curve has been a bit steep at time with lots of resulting mistakes, thus the delay in getting this issue out. Shades of the old saying that it is harder to teach an old dog new tricks! The fact that the summer 1998 Symposium was canceled did not help matters, either.

You will find some interesting items in this issue. For the first time the **Honorees** are not scientists or researchers but actually our clients, ranchers in this case. It is thanks to them that a big boost in leafy spurge research and its application came about. Never underestimate the power of grass roots support! I wish to thank Russ Lorenz for his help in preparing the write-up for the Honorees.

I was supposed to attend the 11th Annual Nebraska Leafy Spurge Conference in Chadron, NE, August 12 & 13, 1998. Unfortunately a heart attack prevented me from doing that. With the help of an angioplasty I am recovering nicely. Thanks to Lora Hawkins O'Rourke, USDA/FS in Chadron, you will find a nice summary of what occurred. She also sent me a summary of two other items that were given at that time. You will enjoy the write-up on the Stillwater Project. It shows what can be accomplished with our students when a little imagination and cooperation is thrown into the mix.

Your editor was able to attend the joint annual meeting of the Entomological Society of America and the American Phytopathological Society, which took place November 8-12, 1998, at the Las Vegas Hilton. In addition to symposia and informal conferences, over 1200 posters were displayed. Believe it or not two of them dealt with leafy spurge. At one informal conference, "Biological Control in Insect & Plant Pathogen Systems," Dr. Peter Harris, our Honoree two years ago at Brandon, Canada, received an award. He was introduced by Dr. Judy Myers, Professor of Plant Sciences, University of British Columbia. She gave a brief recap of his career illustrated with some interesting slides, then presented him with the **IOBC** (International Organization of Biological Control) **Distinguished Biological Control Scientist Award**. I was so pleased to have been able to witness this as Dr. Harris has certainly done a great deal for leafy spurge control.

I will need items from you, my subscribers, for the February issue, which is looming fast on the horizon. Now that winter is upon us you should have more time to reflect on your leafy spurge problems and ideas. Please share them with the readers of **Leafy Spurge *News***. Send them to me by mail, by FAX, on a floppy if more than a few paragraphs (cuts down on the retyping!), or by e-mail. I extend Seasons Greetings to all of you.

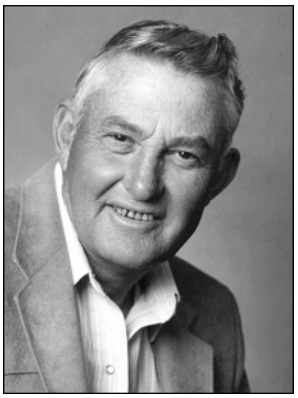
C.H. Schmidt, Editor
(701) 293-0365, Fax (701) 231-8474
e-mail cschmidt@ndsuext.nodak.edu

Leafy Spurge Honorees

Bob Thoft & Kelly Miller

This issue honors two ranchers, Bob Thoft from Stevensville, Montana, and Kelly Miller from Towner, North Dakota. These two ranchers had a tremendous influence in the acceptance, implementation, and application of biological control of leafy spurge in the United States, especially in the Northern Great Plains.

Here is a little background on the two dedicated ranchers who spent a lot of time promoting biological control and proved once again that when grass-roots people get involved, things get done!



Bob Thoft was born on a ranch in the Bitterroot valley of Montana. He dedicated his life to practicing and promoting agriculture. In 1978 he was elected to the Montana legislature, and spent 14 years as a legislator before retiring so he could devote more time on his ranch. Bob served in many local and state agricultural organizations. He began to actively promote biological weed control in 1965 when his county weed control district was formed. Through his efforts, grant money was obtained to support a Montana State University graduate student to study the use of an insect to control spotted Knapweed, a major weed problem in the Bitterroot Valley. During his first term in the Montana Legislature, he introduced a bill that provided funds for a greenhouse at the Montana Western Agricultural Research Center, Corvallis, Montana. He actively promoted the development of biological control programs for other weeds, including leafy spurge.

Kelly Miller was born and raised on a ranch near Towner, North Dakota. He obtained a degree in Animal Science at North Dakota State University, then returned to his families third-generation farm and ranch operation. Kelly has always been a mover and a shaker in the cattle industry, on the local, state and national level. He served as the first president of the McHenry County Farm Bureau and the Towner Rural Fire Protection District. He is past president of the North Dakota Stockmen's Association; he served as he Association lobbyist for 14 years and was awarded honorary life membership in 1970 and was recipient of their Top Hand award in 1996. He served as president of the North Dakota State University Presidents Ag Club and was a board member of the alumni association. He earned the NDSU Friends of Extension Alumni Achievement and the Agriculturist awards. In addition to these and many other activities, he is very active in the National Cattlemen's Association, the National Livestock and Meat Board, and the Livestock Merchandising Institute.

During a brain-storming session in 1980, Lloyd Wendel of USDA/APHIS/PPQ, Russell Lorenz of USDA/ARS, and others, discussed the possibility of sending a landowner from each of the state with active leafy spurge control programs to Europe to see first-hand what insects can do to control the weed. A plan was devised for such a trip, but only two states provided people for the trip, Bob Thoft from Montana and Kelly Miller from North Dakota.

Financial support for their trip came from several agricultural organizations in Montana and North Dakota. After the trip, these organizations provided an effective outlet for Bob and Kelly to report on their trip and to share their enthusiasm for the development of a biological control program on leafy spurge.

In July of 1981, Bob Thoft (and his wife Alice) and Kelly Miller made the trip. They visited several places where leafy spurge grew, but often they had trouble actually finding leafy spurge. It was there, but they saw first-hand how the insects and diseases keep the weed from being an economic problem. They visited the USDA/ARS Biological Control of Weeds Laboratory, Rome, Italy and the CIBC Laboratory in Delemont, Switzerland. These two laboratories serve United States and Canada, respectively. They cooperate and coordinate the collection and screening research on insects and diseases proposed for introduction to North America. This process takes from 5 to 7 years for each species and any that could become problems in North America are rejected. Further screening is done in quarantine facilities in North America before the control agent is released for use. USDA/APHIS is an active partner in the USDA program, and Rome lab was moved to Montpellier, France.

Neal R. Spencer was Laboratory Director at the Rome Laboratory when the Thofts and Kelly Miller visited. They were very impressed with Dr. Spenser and when his overseas tour of duty was over, Kelly and Bob actively promoted his transfer to the Northern Great Plains. Dr. Spenser is now located at the USDA/ARS Laboratory in Sidney Montana. At the time of their visit, Neal Spenser made the statement that “As far as

anybody can remember, this is the first visit to the Lab by users of our technology since the inception of the Lab 22 years ago."

Upon their return home, Bob and Kelly evaluated what they had seen and developed recommendations on what needed to be done to increase the biological control efforts in the United States. Their major emphasis was on leafy spurge, but other weeds of European origin as weed problems for other areas of North America were also considered. Their recommendations made the following points:

- Progress and success would require development of an active program.
- It would require enhancing the overseas collection and screening program.
- It would require a regional quarantine facility in conjunction with USDA/APHIS and ARS. This quarantine facility later was built in Bozeman, Montana.
- It would require local organization, on the county level, to interface with the State and Federal agencies responsible for managing the increase and release of biological agents.

Reports of their impressions of the leafy spurge situation in Europe and the limited efforts on collection and screening being done overseas and their enthusiasm for the potential of biological control of leafy spurge was well received by people attending meetings at which Bob and Kelly were asked to report. They spent a lot of time and travel, mostly at their own expense, promoting biocontrol. Thanks to this grass roots support, a viable biocontrol program emerged at Federal, State, and Local levels.

As Bob Thoft so aptly said "I've been able to generate a good deal of support for biocontrol with my position as biocontrol representative on our state weed Trust Fund Council. I know I've been a thorn in the side of a lot of people but there didn't seem to be any other way to get people to do something." Kelly Miller made the statement, many times, that biocontrol is not going to be a magic potion, but is another part of the weed control program. Using all the control methods "twenty years from now you will be having morning coffee, look out the window and remark that there appears to be less spurge on the hill than there used to be." He made that statement a little over 20 years ago, and it is beginning to happen!

If you have the opportunity to talk to Bob or Kelly, thank them for their dedication and persistence in promoting biocontrol. They deserve it!

Leafy Spurge Problems in Parker, Colorado

The Town of Parker, Colorado has a serious problem with leafy spurge infestations in the drainage areas and creekside open space properties in the Town limits. In the past few years, controls have been limited to a few small areas where herbicides and biological controls have been implememted, with limited success. There are several areas where development had started to occur but either failure to obtain funding or appropriate zoning has stagnated the process, and leafy spurge has spread like the proverbial wildfire. Many location in Town are subject to spread of spurge from neighboring properties, and in several cases the infestations cover large percentages of open space and riparian areas. It has affected native grasses and vegetation to the point where many of the areas are not usable for the reestablishement of disturbed native species, unless control are effective at reclaiming the lands.

The Town, in conjunction with Douglas County, is planning to take strong preventative measures starting with next spring's season to do joint controls of the drainage areas and try to gain some success with limiting the spread of spurge. Douglas County has had a very active and long-term program of controls in place for several years now, and Parker is developing methods of control to also establish reductions in the acreage affected.

We would welcome hearing from any municipality or county which has initiated a program of conrols in a closely developed environment, and any successes or failures encountered. Any help you can provide us will be much appreciated. Please contact Mark.

Mark Hestand
Compliance Official, Code Enforcement Division
20120 E. Mainstreet
Parker CO 80134
(303)841-2332, Fax (303) 841-3223

Biological Control of Leafy Spurge

The goal of the Sidney leafy spurge program is to conduct research on the biological control of this noxious weed. An important segment of this program is to introduce and establish new biocontrol agents for leafy spurge management. In addition, we will identify suitable biocontrol agents for a mass-rearing program and develop the technology to increase the availability of those agents.

The following biocontrol agents and their effectiveness in controlling leafy spurge were discussed at the Nebraska Leafy Spurge Symposium: *Oberea erythrocephala, Aphthona* ssp., and *Spurgia esula. Oberea,* the red-headed leafy spurge stem borer, is well established in Stillwater Co., Montana. Five species of *Aphthona* flea beetles are well established in North America for leafy spurge control: *A. cyparissiae, A. czwalinae, A. flava, A. lacertosa,* and *A. nigriscutis.* A mix of *A. czwalinae,* and *A. lacertosa* has been widely distributed from a 1987 release in eastern North Dakota. Introduced flea beetles have been particularly effective in local areas due to the destructive activity of the larval feeding on the roots which subsequently exposes the weed to invasion by plant pathogens. At one research site, the canopy cover of leafy spurge was reduced from 57% to fewer than 2% within six years of release of the flea beetles. However, some flea beetle releases have established well and are showing control while others have not even established. Flea beetle species occur in narrowly defined niches while leafy spurge infests many different niches. Thus, in some instances, insects populations do not increase because of poor site selection for the species. Research studies are ongoing to determine the optimum habitats for introduced biocontrol agents. *Spurgia esulae,* a gall midge, is helpful in preventing the seed production of leafy spurge and is most effective when combined with another agent such as the flea beetles.

Relatively new or recently approved agents that look promising are: *A. abdominalis, Chamaesphecia crassicornis* and *Spurgia capitigena. Aphthona abdominalis* is a multi-voltine flea beetle, while all the other flea beetles have only one generation per year. *Chamaesphecia,* a root-boring, clear-wing moth, is believed to be established in North Dakota. This species is a target for a USDA-ARS mass-rearing project. *Spurgia capitigena,* a sister gall midge to *S. esula,* looks promising in reducing seed production especially along waterways since it is collected in France and in moist areas.

Current ARS research includes the following insects: *Thamnurgus euphorbiae* (stem-boring beetle), *Aphthona chinchihi* and *A. seriata.* The two *Aphthona* species are adapted to the rigid winters in Inner Mongolia and may be well suited to our northern spurge infestations. In addition, nine previously unstudied species of insects were discovered in this summer's survey of Russia.

Other on-going projects at the Sidney research station include the TEAM (**T**he **E**cological **A**reawide **M**anagement) Leafy Spurge project which is funded and lead by ARS in partnership with APHIS. The project study area is the Little Missouri River Drainage in Wyoming, Montana, South Dakota and North Dakota. TEAM Leafy Spurge was highlighted in the September issue of Leafy Spurge News.

K. Mann
USDA/ARS
1500 N. Central Avenue
Sidney MT 59270
(406) 482-9428

Leafy Spruge in Arapahoe County, Colorado

Arapahoe County's leafy spurge problems are limited, so far, to right-of-ways, creek bottoms and in some instances, pastures and rangelands. Leafy spurge is relatively new to this area and is a problem that we have had to deal with more frequently in the last ten years. Every infestation we have is at least increasing in size by 25 percent every year and I have no reason to believe that number will be any less again this year. Fortunately, we can still contain a number of the current infestations before they get too far out of control.

The main priority for this year and probably for the next, is education. Many of our citizens in Arapahoe County have never seen or heard of leafy spurge; I know this is hard to believe but it is very much the case. The more we can spread the word the better off we will be in the future for spotting new infestations and controlling the existing ones. Education and awareness will be done through news releases, Colorado State University Cooperative Extension and through a web site (www.arapcsuext.org/agri/andover.html). We have had good success so far but our efforts are still not good enough, we are always looking to expand our efforts!

R. Johnson
Weed Control Inspector
Arapahoe County, Colorado
5334 S. Prince St.
Littleton CO 80166-0001
(303) 795-4450, FAX (303) 798-6054

The Stillwater Project

The Stillwater project began as an idea to enhance the educational opportunities for students by exposing them to some real hands-on training. It was a joint venture between the Stillwater county extension office with Chuck Egan, the Stillwater Weed District, Montana, Wayne Pearson along with the Columbus High School Agriscience program and FFA. Both of these men are instrumental in the success of this project.

In conjunction first with ARS, Norm Reese came down from Montana State University to teach several classes in entomology. Students received valuable training in insect identification and the importance of biological control of weeds using insects. Along with this training also came some insect releases from ARS in Leafy Spurge areas for the students to study and conduct research projects to determine biocontrol effectiveness.

The Stillwater County Weed District already had started with the sheep and goat grazing projects and some of the insect release work. More research work was needed on the various projects and all of the Stillwater school districts were invited to take part in those projects. All declined but the Columbus Agriscience Department.

Chuck Egan, Wayne Pearson and Jim Larsen got together on several occasions to discuss the importance of hands-on training for students and ways to incorporate research education and training for the agriscience students. After brainstorming, several ideas and projects were introduced and thus the Stillwater Project was born.

The first task was to make release cages for the insect release sites. These 20' by 20' cages allowed for release of insects to go about their work undisturbed by outside environments. The students built these cages in the ag shop and erected them on-site. Although abandoned later the cages provided the project with information about changing environments.

The students received training in the release sites by several people and agencies including ARS, BLM and the local weed district. Norm Reese and Chuck Quimby of ARS trained the students in research methodology while Bill Volf and Hank McNeil from BLM established training in management and weed control as well as soils and herbicide research.

Parts of the project that have been worked on since its beginning is the establishment of weather data that can be correlated with insect growth and management practices through the use of a RAWS unit provided by BLM: soils pathogen research: DNA gene mapping: GPS site mapping using CAD and a tremble GPS unit (see Figure 2 on page 7): insect collection and redistribution,: and a variety of agriscience tours and workshops. All of this promoted inter-agency cooperation to provide up-to-date hands-on training for students in the agricultural research area. Students are now conducting experiments and actively learning about the career opportunities in the field of agriculture and sharing that knowledge with others whenever the opportunity arises.

Because of the dedication of all the agencies involved in this unique cooperative project to provide a quality education to aspiring agriculture students, career awareness and weed control have become a major part of the Columbus Agriscience curriculum. The Stillwater Project will continue to inspire students to enter the area of agriculture and pursue a rewarding future that will be beneficial to this state, this nation and the world.

Jim Larsen
Columbus High School
P.O. Box 899
Columbus MT 59019

Wyoming Leafy Spurge Program From 1997 to 1997

The Leafy spurge program in Wyoming became a comprehensive program in 1979 with the passage of the Wyoming Leafy Spurge Act of 1978. Previous to 1978, leafy spurge work was conducted by districts but was not very organized.

From 1979 to 1989 the program was primarily a herbicide program. One third of the area was treated each year because of the lack of funding to treat all of the infestations at one time and because Tordon (the most effective chemical during that period of time) gave control for several seasons. There was also some experimental biological control in progress.

This program did not eliminate leafy spurge. This program did not reduce leafy spurge. This program did keep it in check: Wyoming went from approximately 50,000 acres in 1979 to 65,000 in 1997. Other states did not fare as well.

In 1990, the Special Management Program Law was passed. It allowed two weeds or pests to be treated from an additional second mill levy at the county level and

Wyoming continued on page 6

Wyoming continued from page 5

advocated an integrated Weed Management Program, which included biological control, grazing, competitive vegetation, herbicides, prevention, containment, and management components.

Estimated Leafy Spurge 1979	50,000 Acres
Estimated Total Cost 1979-1998	$27,140,630
Estimated Total Acres treated 1979-1998	400,224 Acres
Estimated Leafy Spurge 1997	65,000 Acres

The Down Side

Herbicides are expensive and didn't eliminate leafy spurge. Sheep and goat grazing were effective in controlling leafy spurge in the short term if you had a good herder. After the animals are removed, the spurge is back. Biocontrols looked promising but:

- *Aphthona nigriscutis* established in about half the sites.
- *Aphthona lasertosa* has not been around very long.
- Land owners quit treating when biological agents are introduced and the plant spreads faster than the insects.

The Up Side

An Integrated Weed Management approach appears to be effective and it also allows monetary, personnel and equipment resources to stretch farther. It appears to be easy on natural resources and the environment. A second mill levy reduced legislature appropriations while providing local funding. Over $27 million was estimated to have been spent in Wyoming to control leafy spurge. We did see an increase in leafy spurge acreage from 50,000 acres to 65,000 in 20 years, however this increase many be due to better reporting by the districts. Wyoming's leafy spurge infestations could easily have been 250,000 or 500,000 acres today if no action had been taken.

R. Reichenbach
Weed & Pest Coordinator
Wyoming Department of Agriculture

PRIDE Hosts Nebraska Leaf

The 11th Annual Nebraska Leafy Spurge Working Task Force Conference was hosted by Panhandle Research Integration for Discovery Education (PRIDE), a non-profit organization made up of numerous persons and organizations dedicated to noxious weed education and control. The conference was held in the northwest corner of the state at Chadron. Speakers , as well as participants, came from Utah, South Dakota, Wyoming, North Dakota, Montana, Idaho, and Nebraska..

The two day meeting held August 12 and 13, 1998 included an all-day field trip and an all-day technical paper session held at Chadron State College. During the field tour, participants looked at perennial grasses that out compete Canada thistle and leafy spurge. Howard Horton, Range Scientist, USDA/ARS, Logan, Utah, along with James T. O'Rourke, Agriculture Professor, Chadron State College, discussed the benefits of these grasses. Tom Gee, Dow Agrosciences, demonstrated the use of the "AUM Analyzer" which is a method that determines stocking rates and the effect of noxious weeds on total forage production (see Figure 1).

John Madsen, Dawes County Superintendent, Cris Burks, and Mitch Coffin, Nebraska Department of Agriculture (NDA) , discussed biological control of leafy spurge at a *Aphthona czwalinae* and *A. lacertosa* release site. Long term monitoring and maintenance was stressed. Several angora goats were on hand and owner Kenneth Luce described how he contracts with people to control leafy spurge with his herd of angora goats.

Figure 1. Tom Gee, Dow Agrosciences, discusses the Animal Unit Month (AUM) Analyzer and the relationship of increased forage production on lands with noxious weed control.

purge Conference

A steak fry sponsored by Dow Agrosciences was held the evening of the 12th at Fort Robinson State Park.

The technical paper presentation held on the 13th was also very interesting and very well attended. Jim Lees, Charter member of the Dawes County Leafy Spurge Task Force was the master of ceremonies for the day.

Cydney Janssen, Assistant Director of Agriculture, NDA, pointed out that 47 million acres of the total 49 million acres within the state are tied to agriculture. She described the economic struggles of the ag producer and future needs and programs to support the agriculture industries of the state.

Dan Wiley, Director of the Upper Niobrara-White Natural Resources District, presented "Ethics and Environmental Education." Dan broke out ethics , environment, and education and how each of us are teachers in our own professions and the need to solve problems in a cooperative effort.

Kim Mann, Biological Technician, USDA/ARS, updated the group on the variety of leafy spurge and Canada thistle biological agents being researched for release and those that are currently being used. Those promising species include: *A. abdominalis, Spurgia esula, Chamaesphecia crassicornis,* and *Spurgia capitigena*.

Howard Horton, Range Scientist, USDA/ARS, Logan Utah, presented "Controlling Noxious Weeds on Arid Rangelands Using Native and Introduced Grasses." Howard talked about the use of native versus introduced species in stabilizing the soil. Holding the soil, our basic resource, in place is the top priority. Native species are in general harder to establish and the trade-off may be increased soil loss. Introduced species do well in harsh arid climates and on sites where the soil and conditions have changed over time. Native species may not do well in these changed conditions. Introduced perennial grass species are an excellent choice for these disturbed sites.

Maria Fisher in her talk "Mission Impossible?" described the biological control agents she uses in an ongoing project on her families ranch. Maria represented the Nebraska Section, Society for Range Management as a High School Youth Forum Delegate at a number of professional meetings including the International SRM meeting held in Guadalajara, Mexico last February.

Jim Larsen, Agriculture Instructor, Columbus High School, Wayne Pearson, Stillwater County Weed Supervisor, Montana, and 10 students held the audience's attention with GPS technology (see Figure 2), gene splicing, and individual reports by the students on their research projects on leafy spurge control efforts (see additional information in this issue).

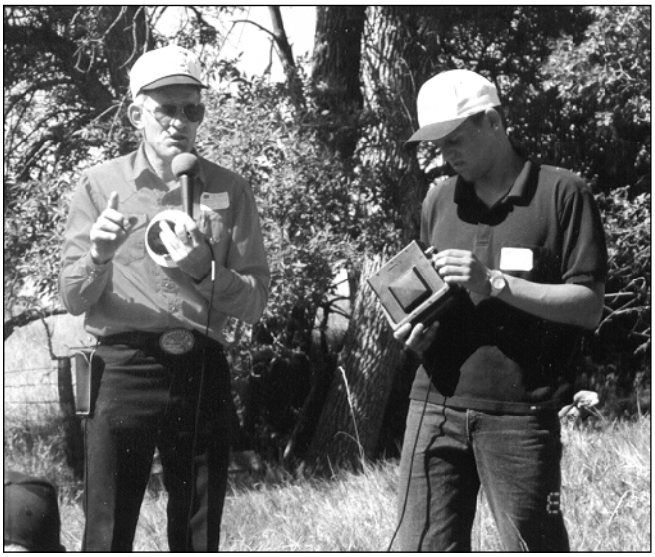


Figure 2. Jim Larsen (left) and Luke Larsen (right) demonstrate the use of a GPS unit for mapping leafy spurge infestations.

The meeting was summed up by Judy Engelhaupt, Nebraska Leafy Spurge Task Force President. She stressed the importance of partnerships and working together on noxious weed control and awareness.

L. Hawkins O'Rourke
Pine Ridge Ranger District
16524 Highway 385
Chadron NE 69337-7364
(308) 432-4475, FAX (308) 432-0375

Claude Schmidt
Agricultural Experiment Station
North Dakota State University
Fargo, ND 58105

Non Profit Org.
U.S. Postage
Paid
Permit No. 818
Fargo, N.D.

Ranch Operators' Perceptions of Leafy Spurge

Four hundred and fifty nine ranchers in a five-county region in Montana, North Dakota, South Dakota and Wyoming were surveyed to obtain their opinion and views regarding weed management and problems associated with leafy spurge. This part of the **Team Leafy Spurge** project (see **Leafy Spurge *News*** Vol XX, #2, June 1998 for further details).

Ranchers felt that weeds are an important problem, but are not the most important problems they face which are livestock prices, adverse weather and cost of inputs. Leafy spurge was ranked as the most important weed regardless of whether or not a rancher had leafy spurge. Only a minor percentage of ranchers with leafy spurge rated any control measure as very effective, reinforcing the difficulty in controlling the weed. The majority of ranchers with leafy spurge are planning on combatting it with herbicides and biological agents in the future.

The responses of ranchers to various statements on weeds and range management indicated that ranchers, as a group, are generally very concerned about weeds in rangeland. They generally feel it makes economic sense to control weeds in rangeland, and feel very strongly that public land agencies are not doing enough to control weeds on public lands.

If you would like a copy, free of charge, of the summary Agricultural Economics Report #400-S "Ranch Operators' Perceptions of Leafy Spurge" by R.S. Sell, D. A. Bangsund, F.L. Leistritz and D. Nudell, or the main report, call Carol Jensen, Dept. of Agricultural Economics, P.O. Box 5636, NDSU, Fargo, ND 58105-5636 (Phone 701-231-7441, Fax 701-231-7400), E-mail:cjensen@ndsuext.nodak.edu or on the world wide web at http://agecon.lib.umn.ndsu.html