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Removing the constraints of sheep as an alternative integrated pest management tool

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The history of grazing sheep on leafy spurge infested rangeland goes back to the late 1930's. In 1936 A.K. Bakke stated that sheep will eat leafy spurge if there is an absence of other desirable forbs. Two years later F.W. Christensen and his colleagues reported that sheep will consume leafy spurge and were effective in controlling leafy spurge in southeastern North Dakota. A year later E.A. Helgeson and E.J. Thompson also reported that sheep could be an effective tool in the control of leafy spurge. At this time Helgeson and Thompson suggested that one answer to the invasion of North Dakota grasslands by this noxious weed was to include sheep in a grazing management plan. In 1942 Helgeson and E. J. Longwell quantified that sheep will consume leafy spurge and were effective in controlling leafy spurge in southeastern North Dakota. As late as the 1980's an aerial flight over the Hurdsfield hills area of North Dakota during the height of the leafy spurge flowering season was clear evidence of the impact of sheep on those acreage that had some history of grazing sheep, as opposed to those which did not (Faller 1994). Since the early discovery that sheep are effective in controlling leafy spurge, there have been many disagreements in literature concerning the use of leafy spurge by sheep (Landgraf et al. 1984), due to one or more chemicals found in leafy spurge that elicit an aversive response when cattle and sheep consume leafy spurge (Kronberg and Walker 1993).

In the past 15 years grazing sheep as a biological control for leafy spurge has become more acceptable. Dahl et al. (1999) showed a trend that the use of sheep in a multi-species grazing approach on leafy spurge infested rangeland will be effective in controlling leafy spurge. Lajeunesse et al. (1995) also have stated that grazing animals can help control leafy spurge by increasing the competitiveness of desirable plants through time of grazing and selective removal of the foliage. Nelson et al. (1991) stated ecological benefit of multi-species grazing, besides natural weed control, would be that some natural resources used for plant growth could be diverted from the less desirable species to the more desirable plants. The principle of multi-species grazing is better utilization of rangeland and to improve livestock production. Therefore the grazing habits of cattle and sheep complement one another and offer economical and ecological benefits (Esmail 1991 in Johnson et al. 1999). There still are low use rates due to the lack of knowledge on the proper equipment (fences, water, shelters), competition for the same forage as cattle, expertise/knowledge to work with sheep, predation losses, and sheep are too time consum-

ing (Sell et al. 1998). The Hettinger Research Extension Center has been working the last 6 years to address some of the constraints with a systematic management approach.

According to Sell et al. (1998) 72% of the individuals questioned lack the proper equipment such as fencing, watering facilities, and shelter. Sheep can be retained in five to six strand barb wire fences and woven wire is not needed. By using barb wire we have cut the fencing cost in half and there is no extra work involved except adding two to three more strands of wire to an existing fence. The same watering facilities used by cattle can be used by sheep. Adding fill to one side of the stock tank allows the sheep to water. A stock dam with a firm slope can be used; however, if the dam has a soft slope drinking area, gravel should be applied to allow sheep to reach the watering area easily.

The next constraint in using sheep as a control method for leafy spurge was the competition for the same forage as cattle (Sell et al. 1998). The dietary overlap of sheep and cattle can be high on native and leafy spurge infested rangeland. Our hypothesis is, once the sheep have acquired the taste for leafy spurge, the dietary overlap is small. However, there are still a lot of unknowns that haven't been answered. Such as, does the breed of sheep have an influence on the use of leafy spurge or does the plant community and the level of aversive chemicals found in leafy spurge in a certain geographical area have an effect on consumption, and does the age of the sheep grazing leafy spurge infested rangelands have an effect on leafy spurge use?

The concern of predation has grown since the bounty on coyotes and other predators has been reduced or eliminated. Predation can be reduced by using adult ewes and implementing them into a multi-species grazing practice. We have found that by mixing cattle and sheep together the livestock species tend to bond and usually graze and bed down together in the same area. Predation has been reduced to I to 2% per year in the last five years using this type of management approach.

Lack of expertise/knowledge and sheep are too labor consuming to use are constraints that have been unanswered currently. The Hettinger Research Extension Center, however, is working on these constraints by developing sheep schools to educate producers in the basics of handling and raising sheep. The constraint that sheep are too labor consuming is presently being worked on to remove the additional burden from the cattle producer. TEAM Leafy Spurge, the Hettinger Research Extension Center, and the Department of Agricultural Economics of North Dakota State University are looking into a sheep co-op program, which will eliminate the expertise/knowledge and time consumption involved in raising sheep for the cattle rancher who is interested in using sheep as an alternative method of controlling leafy spurge.

Additional research that is currently in the process is a 4-year study on alternative management systems of sheep production that will enhance the economics of and utilization of sheep grazing as a control method for leafy spurge. This research is concentrating on designing a fall lambing system and an easy sheep system. The easy sheep management scheme is based on reducing lambing facilities and reducing the work load by letting the ewes lamb out on the prairie. This research should bring forth some new questions and answer some older ones.

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