p \yOl'OZ?~~

Appendix A.

Thousand-year-old weed solutioni^

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rUEst COLUMN

Canada thistle: Our worst weed?

fc» ^ byNoshPorili
jc-^p. Bozcman

'i' liitonlaiu raochen, eDvironnmulisli ud land nun-
Ifea all agree: Canada diiittle u one ofthe stale's wont «Md>. This prickly petennial weed iofetti many millona of acres of public and private gnzin{ lands in Montana and the sumxuiding western slates.
: ^ It dramaticallir ledtices aghcullural pcoductivity by dimioishing giuing capacity and incieasinx weed control costs. Increased soil erosion reduced quai and animal diversity, and iocreaaed fire risk are'direcl results of Canada thistle invasion. Equally catastrojihic infestadons occur in environmentally sensitive wildlife habitat andriparian zones.
Exotic weejs like Canada diittle represent the single greatest threat to sustainable ranching and tenestru] ecoijrtiems.
: Biological weed control, utilizing introduced benafldal insects, is considered to be the moat promising conljol lactic against many of Montana' s exotic rangeland aiod pasture weeds. Dnmalically successful weed conliral hu been achieved using iniroduced iniecis jn the jUatted Stales.
' lAilike chemical or mechXiical weed controi metb-
|»^ biological control is a sustainable weed manage^
"—" method. Once an insect Is eitabliihed on its tarraH
.weed, few additional expenses are required. As ue
Imect population builds, greater and greater itreaa ii
CMiled on die weed.
|./'Ajia, the insect naturally disperses to new weed •fatalions without addititnal cost lo Ihe laocfaer. Biotb^ol weed control is proven, pennanenl and cost-,,:
«"«'*«• ,.• • , : , , . . ' : JLidoetiveabiBty and b the moat wideiprpad thisde
•• Because of this racceaa, biologictl weed oootioi ii;; tocreasingly being used io many areas of the weat. Kaocfaers and chemical weed control profeuiooaU are often integrating beneficial insects into their existing weed management programs.

Using insects for weed control is quite simple: colonics ofthe beneficial iawcts are placed into specific weed infested locations and allowed to buildup and atress the target weed.
CuiTcnily, there are four insects available for Canada thislk biological control in Montana. All atlaclc the Ihistle at different tin:es of the year aod/or on different parts of the plant. These insects include a stem and root crown mining weevil, a stem gall fly,a flowahead weevil and a defoliating beetle.
The stem and root crown mining weevil, CtutorkynehusUtura, damages the plant by mining Ihc primary stem and root crown of the tiajttle. Thlt damage affecu die weed's vegetative propagation. Being ven cbtil-hiadv, ihis weevil thrives fm Tnost areas-where Canada thistle isa problem.
Thisde attack by the stem gall fly, Urophomcardul. stimulates the plant to farm a hard, woody growth or gall. Call formation is an energy drain for the thistle plant. Nutrients are directecf into gall formation insieail of flowering and root storage. Multiple galls are posii': ble on a plant and galled stems rarely flower oocmally. 'S This bio-control agent thrivet in tbe moister Ihistle ixt infealed areas.
Another weevil, Larinui plamu, attacks die dilstls'l: flowerbeads thereby damaging the seed producing I capicily of the weed. Canadian teseaich has ed up io 9S perceM teed reductioai by viL
Defoliation by Ihe tortoise beetle.
noa, reduces tbe weed's ability to gadier energy?] the ma. Unforoinately,. defoliation alone is not itrenfol to CmaiU Ihiitjc. IUa beeOe haii.iatu
•: While none of these insects by themselvea will gei lid of Canada ihistle, their combined attack has been sbowD to have an iocieased impact on Ihe weed. ReaUti. fiom anodier Canadian study illustrated that tbe COOK bined impact of the stem weevil and the gall fly wax gifater than either insect alone.
: New sdentilic surveys in Qiina have idcniiOed addidpaal Uiiatle feeding insects as fnture bio-epnuiil -

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ialectt are available ihmi|fa icne couanr weed coMnill and eilmaloerofficea and ftom commeBaat aucnlicta ol, beneficial insects. • .:> ' • ' C^T" "^.t
•• Also, don't forget to encourage plant coiapctitioa' against your weed:. This is u euenlial compooenl of eny bio-cooiroreffort; i^ant compedtioa adds flnthec : "rMsiotheweed.
^^i"" «'j"™"»« oo biological control of Canada cm be (bond by searefaing the Web using the key...;^^

Tgie Ginada thistle gall fly hleps control &nad«ithisU<ibutbretti in a biological tsaa-, tkt'--:^^^m ^ •»/• Ik^h;N«*P»to^ *'*^