

Green Wheatgrass: Reclamation Savior or Ecological Demon?

by Garth Wruck

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Green wheatgrass (*Elymus hoffmannii* K.B. Jensen & K.H. Asay) is a hybrid of quackgrass (*Elytrigia repens* (L.) Nevski) and bluebunch wheatgrass (*Pseudoroegneria spicata* (Pursh.) A. Love). The USDA-ARS Forage and Range Research Laboratory in Logan, Utah has developed and released a variety of this perennial grass called 'NewHy'. 'NewHy' was registered in the United States in February 1991 and has been licensed under Title 5 of the U.S. Plant Variety Protection Act (1970). Because of the seed's similarity in appearance to quackgrass seed, and to avoid problems with noxious weed regulations, the seed was registered and licensed so it can only be marketed as certified seed. This has led to recommendations that the species be registered and licensed in Canada as well.

This presents a problem. Although this licensing and registration protects 'NewHy' seed from being mistaken as quackgrass in seed analyses, quackgrass may now have the ability to masquerade as 'NewHy'. This means that seed lots with quackgrass mistaken as 'NewHy' may still receive certification and be seeded on a large scale. The above recommendations come in response to the fact that green wheatgrass seed is already entering Canada and being used; therefore, it is believed by some that the variety should be registered so that its use can be regulated.

'NewHy' has undergone field evaluation in Utah, Idaho, Montana, and Saskatchewan. The species has shown remarkable performance under moderate to severely saline conditions that receive at least 330 mm (over 13

inches) of precipitation annually. The species has vigorous establishment from spring seeding on dryland sites under harsh conditions and, being a long-lived perennial, is well adapted for use as hay and pasture.

It is anticipated that this species, because of its productivity and palatability, will be a widely used species around sloughs in cultivated land. Green wheatgrass's salt tolerance allows it to establish in these areas like its parent quackgrass, but unlike quackgrass provides attractive forage for livestock. It can be foreseen that this species may also have great potential in reclamation for the revegetation of well sites contaminated by highly saline brine spills or roadsides that experience elevated levels of salinity from de-icing salts. Is this species the answer to these revegetation problems?

It seems that we have heard the story of a valiant forage species saving the prairies before, and the outcome is all too familiar. Although crested wheatgrass kept the prairie soils from blowing into the Atlantic following the droughts of the 1930s, it has now become one of the most invasive species in the Northern Great Plains. Similarly, smooth brome and downy brome were going to be saviors by providing forage for livestock, but no one knew that they would leave their seeded fields and invade almost every native grassland ecosystem in the prairies, choking out native species and becoming two of the most difficult and costly species to control. The first question we should ask ourselves when we are breeding or planning to introduce a new forage species is: are we creating another ecological demon?

The Semiarid Plains Research Centre in Swift Current tested the green wheatgrass variety 'NewHy' for vegetative spread. They found that the hybrid had an average vegetative spread less than quackgrass but greater than 'Carlton' smooth brome. We know the problems smooth brome has caused with its ability to reproduce both vegetatively and through seed, and here we are talking about introducing a species that not only has a greater ability to spread

vegetatively than smooth brome, but is a hybrid that is fully fertile and can produce through seed like smooth brome, as well. The potential also exists for green wheatgrass to backcross with the parent species, which could potentially lead to genetic pollution of populations of native bluebunch wheatgrass. In addition, because green wheatgrass is a hybrid of introduced quackgrass and native bluebunch wheatgrass, it will not only have the ability to establish in low, moist areas but could also invade dry, upland areas where it may out-compete native grass species.

There are native grass species that are adapted to saline conditions that provide good quality, palatable forage for livestock that through development could meet the demands for uses in agriculture and reclamation. Is green wheatgrass a species we should develop, register and promote or should we rely on our experience and acknowledge the "red flags" the research into this species has raised? Although unusual, it may be more beneficial to recommend that this species be added to the Canada Seeds Act as a weed species, possibly avoiding a problem rather than facilitating one.