

Bromus tectorum (cheatgrass or downy brome)

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Researching on Bromus tectorum lead me to a vast collection of literature about the plant species. An almost complete reference on it is provided by the Nature Conservancy, Wildland Weed Program. For my essay/report, I used its “ Element Stewardship Abstract for Bromus tectorum” written by Allan Carpenter and Thomas Murray as my main reference. The plant species Bromus tectorum is an alien grass or an invader that usually takes over “ disturbed ground in shrub-steppe ecosystems of the Western United States and Canada” (Link et al.). The scientific name is of Greek and Latin origins.

According to the work of Upadhyaya et al. , the genus name Bromus is said to have originated from the archaic Greek word bromos, which refers to a particular kind of oat. The ancient Greek word bromos, in addition, means food. The specific epithet, on the other hand, was believed to have been derived from the Latin words tector and tectum, which mean ‘ one who overlays’ and roof, respectively. Bromus tectorum is more commonly known as cheatgrass to local inhabitants. Other parts of North America call it downy brome because of its noticeably hairy leaves. There are many other names associated to this species.

The documented ones include drooping brome, downy cheat, cheat grass brome, slender chess, Mormon oats, and broncoglass (Upadhyaya et al.). Cheatgrass is erect and can rise up to 24 inches high. Its leaves and stems shape into tufts or clumps as seen in Figure 1. The grass has tiny, papery hair like structures that cover its leaves. Bromus tectorum is an annual grass and is usually dense during winter or spring. This annual plant germinates in fall or spring. However, it has been observed that vast numbers of “ cheatgrass seedlings usually germinate after the first fall rain in infested areas” (West).

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Cheatgrass only replicates through seeds. However, it is exceptionally efficient; that is, an individual cheatgrass may reproduce hundreds to thousands of seeds (Mosely et al. 1987 cited in Pyron). Its root system then proceeds to develop for the entire duration of the winter season. By spring, the grass has an already wide-ranging root system, enabling the plant to draw out higher levels of moisture and soil nutrients. Cheatgrass has a compact phenology and usually desiccates and spreads its seeds by mid-June (West 1983). Naturally, it undergoes senescence in summer.

Once dried, these plants can catalyze wildfires in its regions. The frequent occurrence of fires in an area displaces perennials and even other annuals that initially dominate a particular community (West 1983). Cheatgrass has a Eurasian native range (Novak, Mack, and Soltis). However, it is now found in diverse forms of habitats all over the United States; but, it is most distinguished on the “ Columbia-Snake River Plateau, Wyoming Basin, and the northern portion of the Great Basin in disturbed sagebrush steppe communities” (Rice and Mack ; West).

In the mid 1800s, it was accidentally brought into the United States of America. The invasion of North America by *B. tectorum* occurred through multiple introductions (Bartlett et al.). In regions where the soil has especially high levels of potassium in it, cheatgrass is found to grow and proliferate well in the area (Belnap pers. comm. cited in Carpenter et al.). Research has shown that the measured potassium levels in communities can be used to determine and probabilistically predict how susceptible and vulnerable the area may be to cheatgrass takeover.

The amount of potassium in the soil may also be altered to alter the abundance of cheatgrass. By lowering the levels of potassium in the soil, the density of cheatgrass may also be lowered. (Belnap pers. comm. cited in Carpenter et al.). The control of growth and proliferation of cheatgrass in a particular area has shown great significance. Since cheatgrass exhibits both advantage and disadvantages, it is important to be able to moderate its invasion. Cheatgrass has a twofold role; one, as an annoying and pestering weed, and two, a significant “ early season forage for cattle and sheep” (Emmerich et al.

; Upadhyaya et al.). Bromus tectorum takes over “ rangelands, pastures, prairies, and other open areas,” as seen in Figure 2 (www. invasive. org). Consequently, it has the capacity to thoroughly modify the ecosystems it invades. It poses many ecological and environmental problems because of its propensity to completely wipe out all native foliage and vegetation in a particular area and even modify certain fire patterns. The alterations caused by cheatgrass in the frequency of fire cycles is said to be “ the species’ greatest competitive advantage.

” (Whisenant) In sagebrush grassland ecosystem, fire is a natural occurrence (see Figure 3). Those fires usually happened at intervals within the range of 60-100 years. However, in areas where the presence of cheatgrass dominates, areas burn at a much greater and increased frequency, every 3-5 years (Whisenant). With this frequency range, native plants, shrubs, and other perennial grasses cannot keep up and fail to recover. This results to the development of cheatgrass monoculture; other species tend to be completely wiped-out.

The vegetation of a pristine (undisturbed) shrub-steppe ecosystem is populated by “ perennial bunchgrasses and widely spaced shrubs” (Whisenant). According to the work of Whisenant, the species that are commonly replaced by cheatgrass include the following: “ big sagebrush, antelope bitterbrush, bluebunch wheatgrass, crested wheatgrass western wheatgrass, Sandberg bluegrass, needle-and-thread grass, and Thurber’s needlegrass. ” Sagebrush steppe cannot simply persist with this shortened fire interval.

As how Devine put it, “ fire begets cheatgrass and cheatgrass begets fire” (Devine). What are the advantages of Bromus tectorum or cheatgrass? For ranchers, it is especially useful since it provides a large volume of early spring forage for different types of livestock and animals on grazing lands especially in the Intermountain and Pacific Northwest regions (Upadhyaya et al.). In terms of its density and the quality of herbage grown including the wideness of the area covered by cheatgrass, it is “ undoubtedly the most important spring forage in the region” (Upadhyaya et al.

; Emmerich et al.). On the other hand, while ranchers in the Intermountain and Pacific Northwest regions take advantage of cheatgrass, the United States and Canada winter wheat growers consider it as pest—their worst problem (Upadhyaya et al. 1986). According to literature, cheatgrass is a problematic weed in winter wheat. Cheatgrass has many ecological and competitive advantages in contrast with other perennial and annual plants. It has the ability to adapt well and evolve to its native environment and to other environments it invades.

Although this has shown to have certain advantages especially to ranchers for foraging, this characteristic of cheatgrass has posed many problems in the ecology and can be very damaging. In my opinion, it is only proper that human intervention be exercised to control its dominance and invasions. Cheatgrass is a sinister. As discussed, it raises both agricultural and environmental problems. The references that I have read reveal that regulation of cheatgrass invasion will demand “ a combination of chemical control, physical control, vegetative suppression, and proper livestock management where land is grazed” (Carpenter and Murray).

It is obvious that the problem is quite a complex one as it involves many other variables. Moreover, human intervention could possibly worsen the ecological balance. Thus, the U. S. government and other ecological and environmental agencies should seriously and carefully address the problems and implement effective management programs to minimize its infestations yet still making sure that ecological equilibrium is still achieved. Main Reference Carpenter, Allan and Thomas Murray. 1998. “ Element Stewardship Abstract for Bromus tectorum.

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