Phenology of Exotic Invasive Weeds Associated with Downy Brome

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The exotic annual grass downy brome has invaded millions of hectares of rangelands in the Intermountain West. Downy brome increases the chance, rate, season and spread of wildfires, resulting in the destruction of native plant communities and the wildlife that depend on them. Through moisture competition it closes the community to many native perennials. A constant state of repeated disturbance and annual dominance is then exhibited.

Plant Community Structure

Downy brome is the aspect dominant of vast areas of rangelands, frequently referred to as downy brome "mono-cultures". These ill-defined mono-cultures actually host a number of exotic species. These plant community components of the range can occur *pre, co-dominant* or *post* downy brome invasion.

Purpose

Our purpose was to compare the phenology of exotic annual species found in downy brome communities to obtain knowledge on how this array of weeds contributes to the truncation of succession.

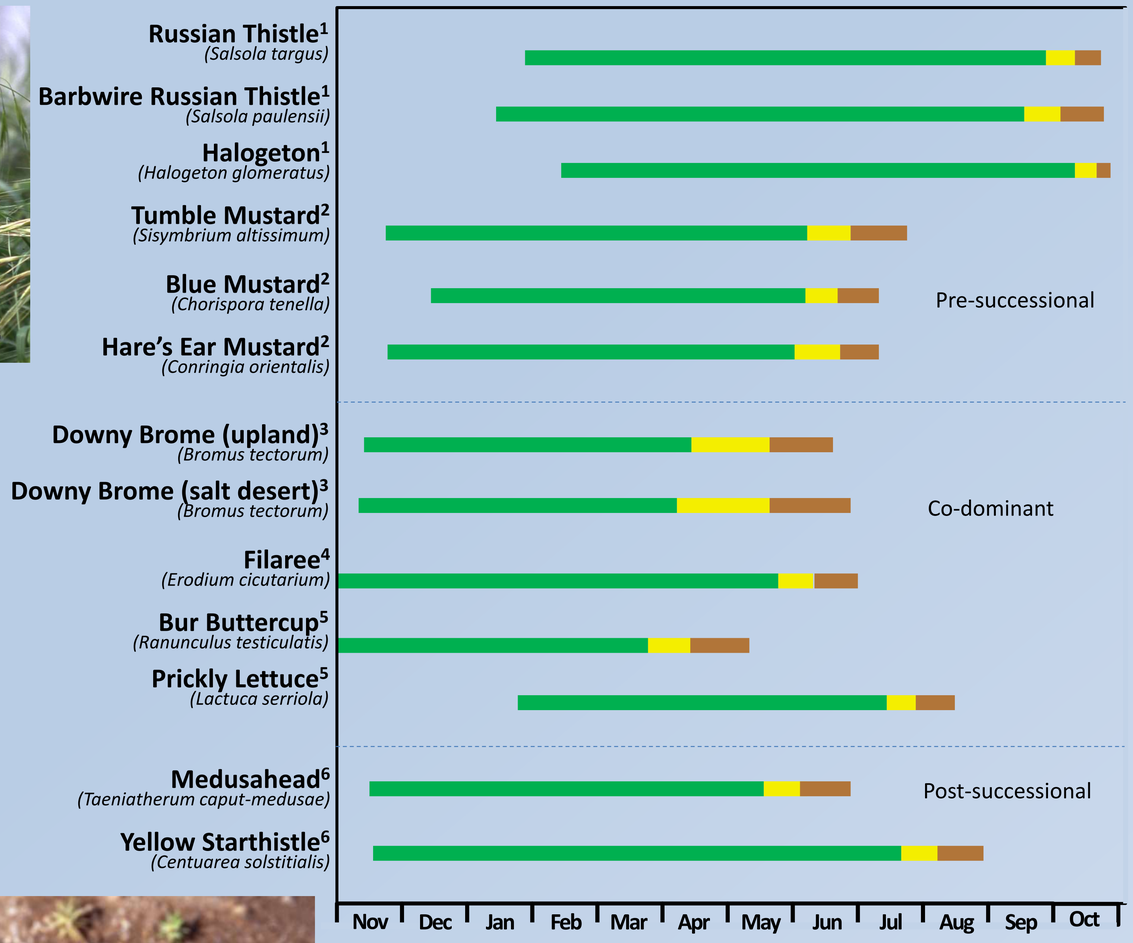


FIGURE 1. Phenology timeline with the following color code: Green = Emergence to flower bud, Yellow = Flower bud to anthesis, and Tan = Anthesis to seed maturity.

Results

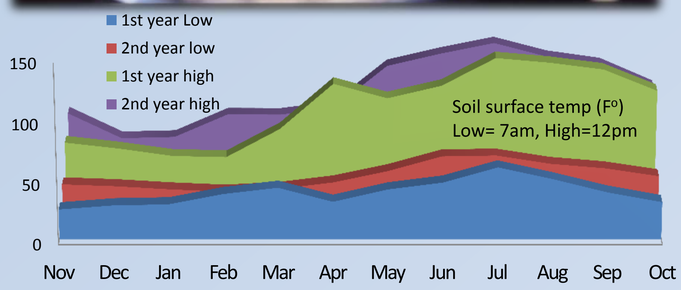
Species phenology grouped into: 1) Bare ground species, 2) Mustard stage, 3) Downy brome dominance, 4) Downy brome cohorts, 5) Extreme ephemeral, 6) Annual species replacing downy brome.

Comparisons to 3) Downy brome dominance

1) and 2) both generally mature later than downy brome
4) *Filaree* co-dominates, at times excluding downy brome
5) *Bur buttercup* germinates early, similar to downy brome yet matures earlier avoiding competition
6) *Yellow starthistle's* late maturity makes it site limited for much of the arid range, while *Medusahead* more closely mimics downy brome phenology.

Methods

Seeds of various exotic annuals were collected from downy brome communities. Each species was individually seeded into 4 replicate pots. (60L sandy loam) (randomized-outdoors, Reno, NV) Pots were seeded (25 seeds) November 1st (repeated 2 years). Phenology notes were taken weekly. Pots were watered as needed until seedlings were established.



Conclusion

The array of exotic weed species that occur either pre-successional, in conjunction, or post-successional to downy brome help to assure the closing of the site to recruitment of the less competitive native perennial species. The yearlong overlapping phonologies ensure complete utilization of the environmental resources available. The succession sequence of these exotic species greatly complicate weed control.