Big Sagebrush Seedling Competition with Variable Densities of Cheatgrass

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Introduction: In this experiment I am analyzing whether sagebrush seedlings do better in higher or lower cheatgrass densities. There is limited research done on the seedling stage of sagebrush making this experiment a valuable first step. In order to get to the seedling stage, we needed to germinate sagebrush seeds which have specific requirements for germination.

Methods:

Part One Germination

- Sagebrush seeds cold treated in 1-4 degrees Celsius for about one month.
- Sagebrush seeds were germinated using filter paper in growth chambers which had day and night cycles with temperature 10-20 degrees Celsius with high humidity.

Part Two Greenhouse (Ongoing)

- 45 seedlings from subspecies *tridentata* and 45 seedlings from subspecies *wyomingensis*.
- Cheatgrass seeds from a singular plant that had over 1000 seeds.
- Sagebrush will be planted with four different levels of cheatgrass density at the same time.
- Leaf count of sagebrush will be measured weekly.
- Height of cheatgrass and sagebrush will be measured weekly.
- At the conclusion of the experiment, biomass will be taken of each sagebrush.

Preliminary Results: In the germination chambers we had 36 different maternal lines starting with 35 to 65 seeds. Four maternal lines had zero seeds germinate while others had over 90% germination. Average germination was 66.06% for ssp. *tridentata* and 80.79% for ssp. *wyomingensis* with zeros excluded.
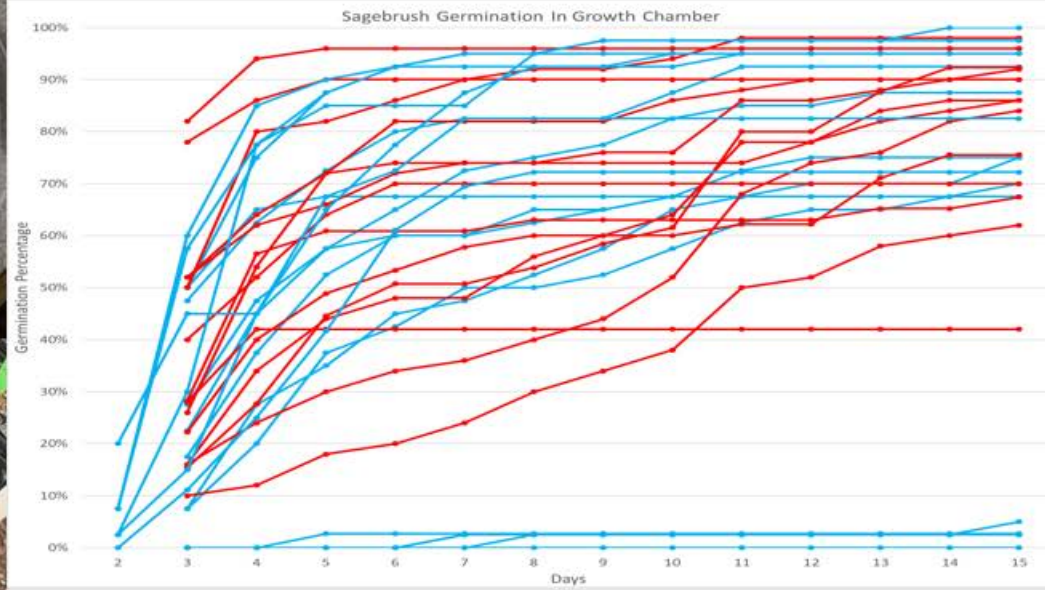

Figure 1: Sagebrush seed germination data. Each line represents a maternal line. Blue shows ssp. *tridentata* and red shows ssp. *wyomingensis*. First count began on either day 2 or 3.

Discussion: Sagebrush germination tended to depend on the population rather than maternal lines with a couple of exceptions with probable immature seeds. Most seeds germinated around the same time though there were some populations that germinated more gradually over time.