

Challenge for Wetland Management: Will Climate Change Help or Hinder the Invasive Reed Canary Grass?

What is Reed Canary Grass?

Reed canary grass (*Phalaris arundinacea*) is a member of the Poaceae or “true grass” family. It has a broad range, existing in much of Europe, the northern United States, and southern Canada. It is an aggressive invader of wetlands in much of its North American range, shading out native plants and forming dense, species-poor stands.

Reed canary grass’ success is due in part to:

- Nitrogen-rich runoff from urban or agricultural areas.
- Its ability to spread by rhizomes, or underground stems. The resources stored in rhizomes allow new shoots to sprout quickly.



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Objectives:

To determine whether global climate change will alter the invasibility of reed canary grass.

To assess differences in reed canary grass’ aggressiveness in high and low nitrogen environments in light of climate change.

The Intergovernmental Panel on Climate Change has found that carbon dioxide (CO₂) has increased since the onset of the Industrial Age and projects it will continue to increase. During photosynthesis, plants fix the carbon in CO₂ and turn it to sugars. How will plants respond when more CO₂ is available in the atmosphere?

Possible Results:

Lew Ziska of the USDA has found that invasives like Canada thistle and leafy spurge increase in biomass an average of 3 times non-invasive species when grown at pre-industrial, present, and projected levels of CO₂. However, most of that increase occurs between pre-industrial and present levels.

Quackgrass, on the other hand, doesn’t level off, but continues to respond when subjected to projected levels of CO₂.

How will reed canary grass respond?

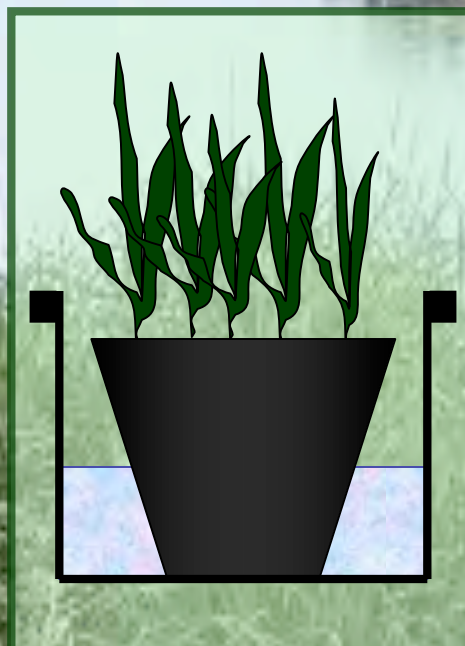
Methods:

Experimental Set up -Compare the growth of reed canary grass to the native fowl mannagrass (*Glyceria striata*) by:

- Growing stands of each species in pots simulating a wetland environment.
- Fertilizing half of the pots with nitrogen.
- Placing the pots in growth chambers, of which half have high CO₂ concentrations.

Measurement

- Measure photosynthetic rates while the plants are growing.
- Determine biomass and allocation patterns (i.e. did the plants allocate more resources to stems and leaves, to rhizomes, or to roots?).
- Compare the amount of sugars stored in rhizomes.



3 gallon pots will be placed in buckets to maintain the water level at ~20 cm below the soil surface



Growth Chambers will be constructed of PVC-pipes with MYLAR® stretched over the frames.



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