



# **Tahoe Whitetop Eradication and Native Plant Community Restoration**

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# The Problem



*Tall whitetop (Lepidium latifolium)*

## **Invasive Weed**

Spreads by rhizomes and can produce 10,000 seeds per plant

- Infests 17 million acres of public rangelands in Western U.S.
  - 25,000 acres in the **Truckee River Watershed**
  - Estimated overall cost: \$123 billion a year
- Drives out beneficial watershed vegetation
- Creates monoculture and destroys diverse wildlife habitat

# The Problem

## *Tall Whitetop (TWT) Eradication*

### Eradication efforts to Date:

- Herbicides and controlled grazing
  - Knock down but not out
- Reason for poor control:
  - Unsuccessful native plant community restoration



# The Problem

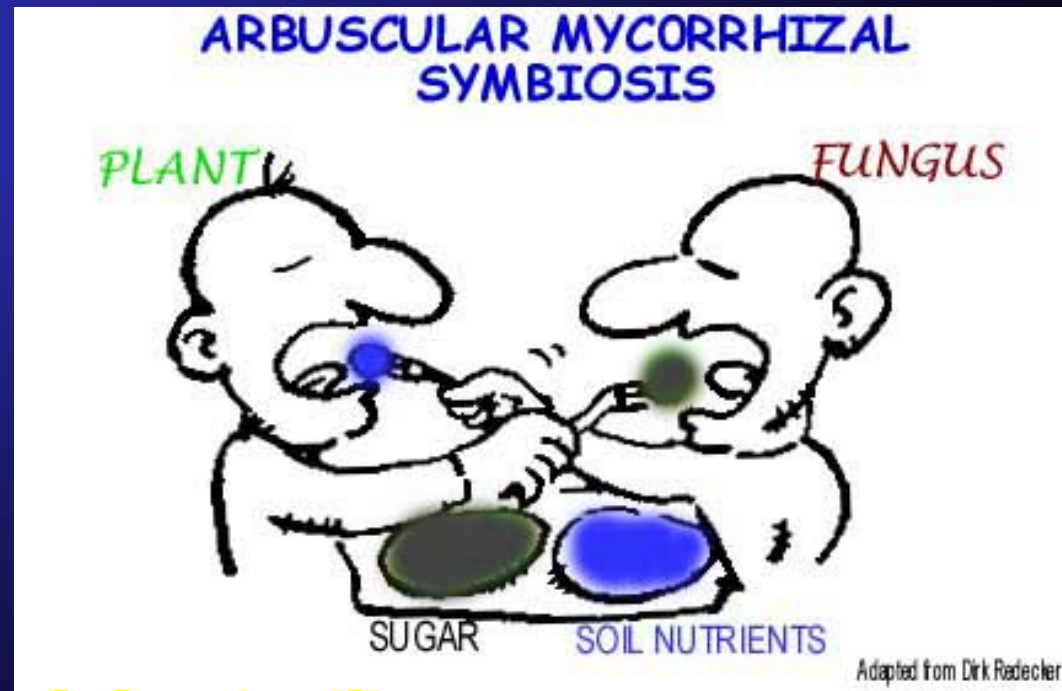
## Hypothesis for Native Restoration Failures:

- **Herbicide residues** inhibits germination of native seed applied after treatment
  - No quick establishment to compete with TWT
- TWT monoculture changes **soil biology**
  - TWT is a nonmycorrhizal mustard
  - Soil bioassay did not show mycorrhiza

# Why is Mycorrhiza Important?

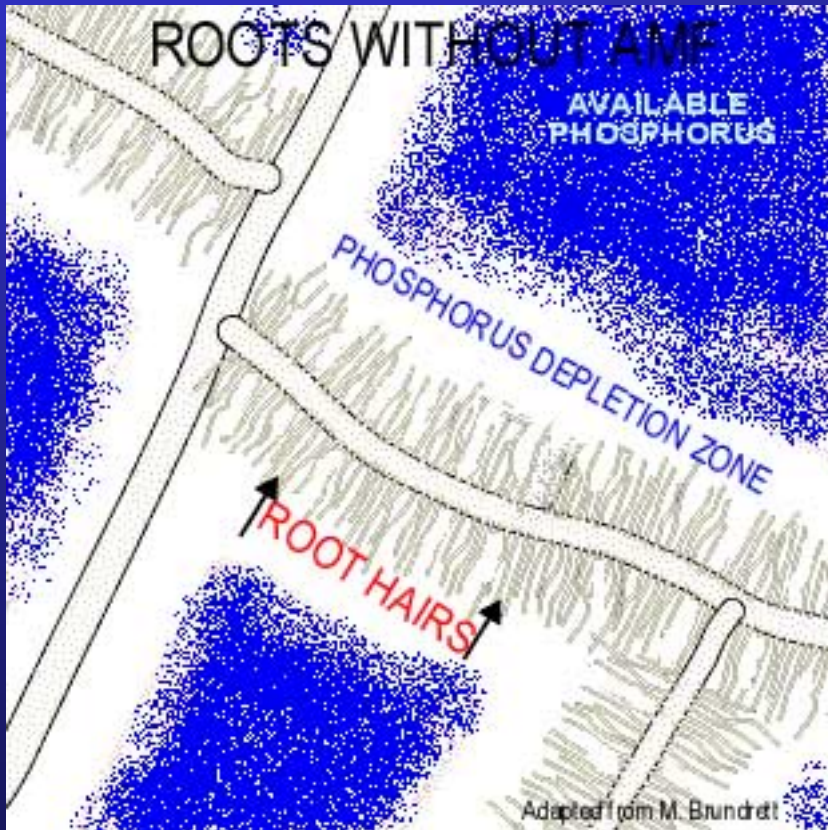
## AM *SYMBIOSIS*

- **Ancient**
  - 400 million yrs ago
  - 1<sup>st</sup> land plants
- **AM fungi**
  - Essential to land plant establishment
- **Plant hosts**
  - 90% of all species
  - Only 4 non-mycorrhizal plant families

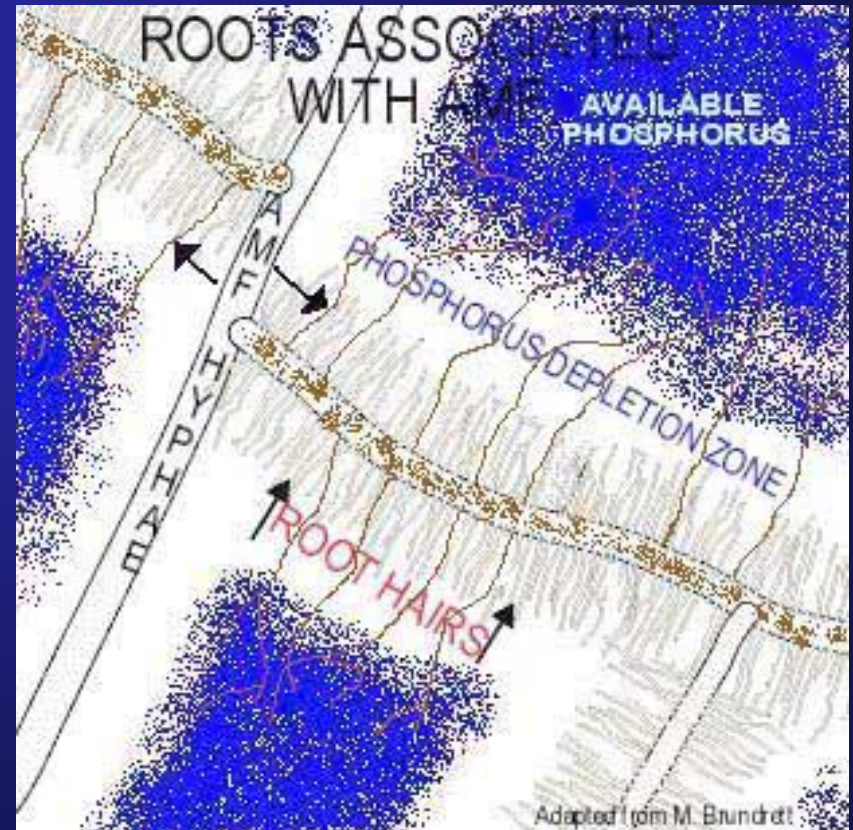


# Why is Mycorrhiza Important?

## Role of AM Symbiosis



Roots without AM fungi



Roots Associated with AM fungi



With Mycorrhiza

Not Treated

# The Proposed Solution

Treat with herbicide and follow with mycorrhiza and activated charcoal treated seed

- **Activated charcoal** will neutralize residual herbicide surrounding seed to allow germ
- **Mycorrhiza** will help increase establishment and survival of mycorrhiza dependent natives



# Demonstration Project

One acre plot at 102 Ranch along Truckee River  
(Tracy, NV)

2 Irrigation levels- No Irrigation and Supplemental  
2 Seed treatments – Control and Treated (M + C)  
2 Herbicide treatments – Plateau and untreated

# Demonstration Project

## Project monitoring (3 years)

- Vegetation:
  - Germination, cover, frequency, diversity, establishment, vigor, and vitality, permanent photo points
- Mycorrhiza:
  - Root sampling and staining for mycorrhiza presence and abundance
- Soil Fertility
- Soil Microbiology
  - Soil bacteria and fungal presence, diversity and activity

# **Demonstration Project**

**102 Ranch Project Cooperators:**

**Truckee River Investors, Reforestation Technologies Int'l (RTI), BASF, Western Botanical Services, Great Basin Earthwork, and Juniper Rose**

**Special thanks to everyone who have helped get this project started!**

# QUESTIONS?

