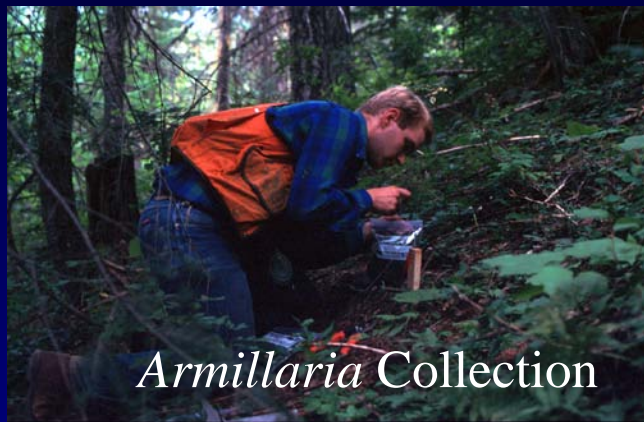


FINAL RESULTS  
from the Forest Health Experiment  
*Armillaria ostoyae* Root Disease  
Inoculation Project

Intermountain Forest Tree Nutrition Coop

Terry Shaw

# *Armillaria* Inoculation Study

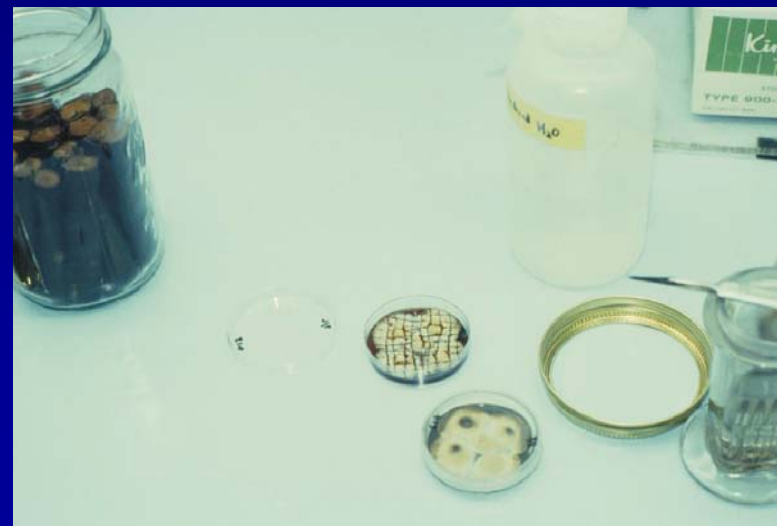
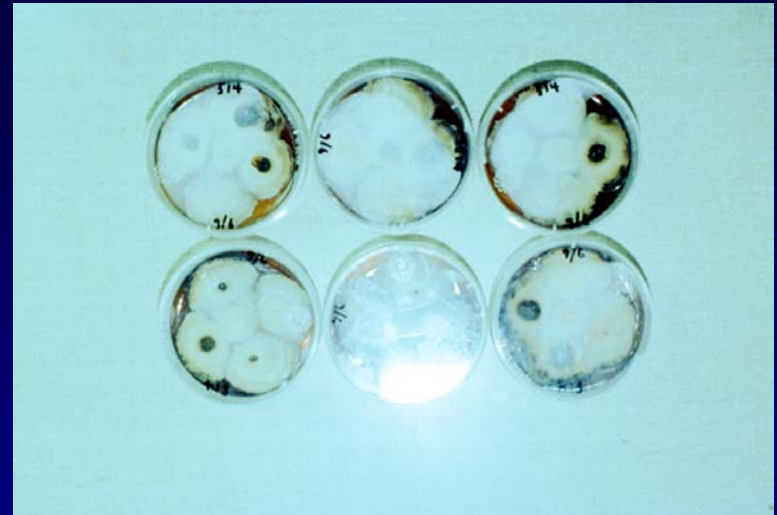


## 1999-2000 *Armillaria* Collection Summary

Collection Year	1999	2000
Number of Sites	15	15
Number sites <i>Armillaria</i> collected	12	11
Number sites with <i>Armillaria ostoyae</i>	8	9

# *Armillaria* Collection Summary

	Collection Year	
	1999	2000
No. Samples	627	672
No. Isolates	519	650
No. Genets	111	110
No. Pairings	4140	4014



# 1999-2000 *Armillaria* Species Collection

Species	Number of Genets
<i>ostoyae</i>	62
NABS X	16
NABS III <i>calvescens</i> NABS V <i>Sinapina</i> Complex NABS VII <i>Gallica</i>	14
NABS X/ III, V, VII	31
<i>nabsnona</i>	1

# IFTNC Inoculation Sites

2000

2001

Site	Region	Site	Region
Bovill (335)	NID	Spirit Lake (336)	NID
Enterprise (337)	NEO	Grasshopper (341)	NID
Huckleberry (354)	NID	Upper Pataha (342)	SEWA
Stanton (355)	NID	Springdale (346)	NEWA
Soldier (357)	NID	Whiskey Butte (348)	NID
Furport (360)	NEWA	Pivash (349)	NID
Hanson (361)	NEWA	Sportsman Access (356)	NID
Haverland (362)	NEWA	Skookum Lake (358)	NEWA
		Dick's Creek (359)	NID

# Forest Health Core Treatment Design

## *A. ostoyae* Inoculation Design

 <p>0#N/a + 0#K/a</p> 	<p>300#N/a + 0#K/a</p>
   <p>0#N/a</p> <p>+ 170#K/a</p>  	 <p>300#N/a</p> <p>+ 170#K/a</p>    

# *Armillaria ostoyae*

## Inoculum

Inoculum Blocks



*Armillaria* Field Ready

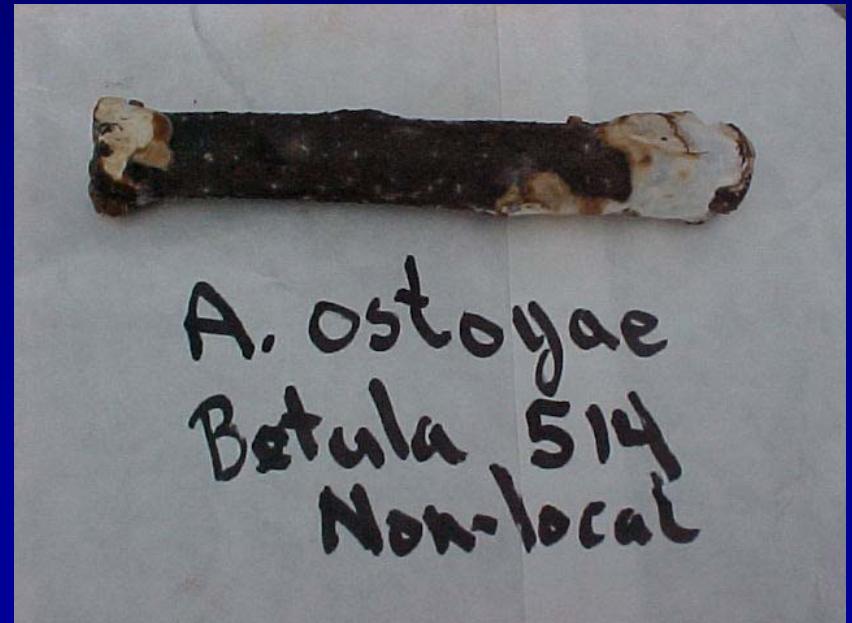
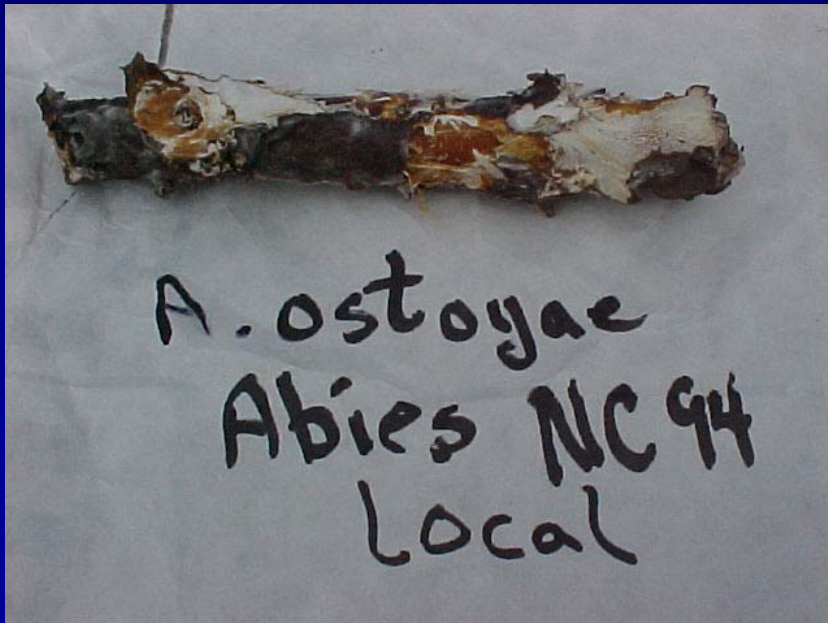




# Forest Health Root Inoculation

## Pathogenetic *A. ostoyae* Isolates

- Local *A. ostoyae* Isolate
- Regional *A. ostoyae* Isolate



# *Armillaria* Inoculation

Each tree received one local isolate and one regional isolate



Secured with plastic wrap



Five trees per plot were inoculated

Finished product



# Root Collection



Three years after inoculation



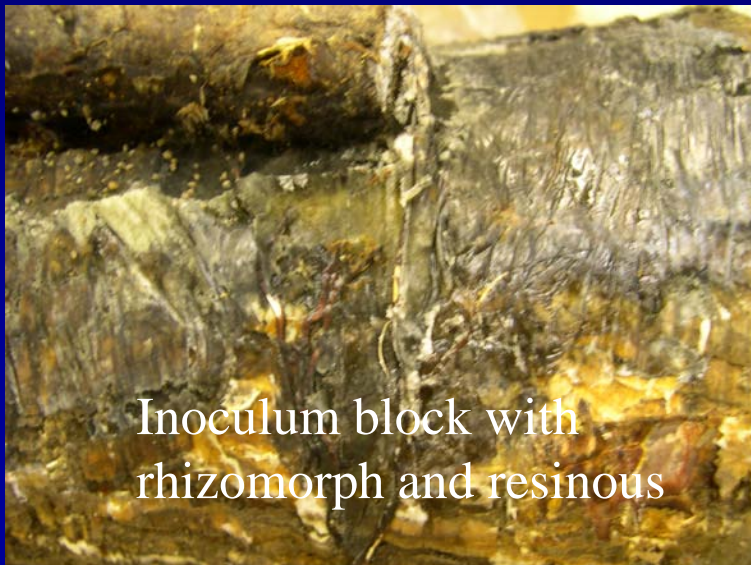
# Infection Verification



Rhizomorph w/ mycelial fan



Rhizomorph attached to inoculum block



Inoculum block with rhizomorph and resinous



Rhizomorph/wound contact

# Infection Verification Methods



# Infection Verification Methods Ratings

- Block
  - Viable, infection rhizomorph or mycelial fan
- Root Mycelial Fan Rating
  - Absent or present
  - Surface or under root bark (outer or inner bark, cambium)
  - Origin – rhizomorph or mycelial fan
  - Origin – block or invader
- Root Rhizomorph Rating
  - Absent or present
  - Attached to surface or not attached to surface
  - Origin – block or invader
  - Absent or present
  - Attached or not attached
  - Origin – block or invader

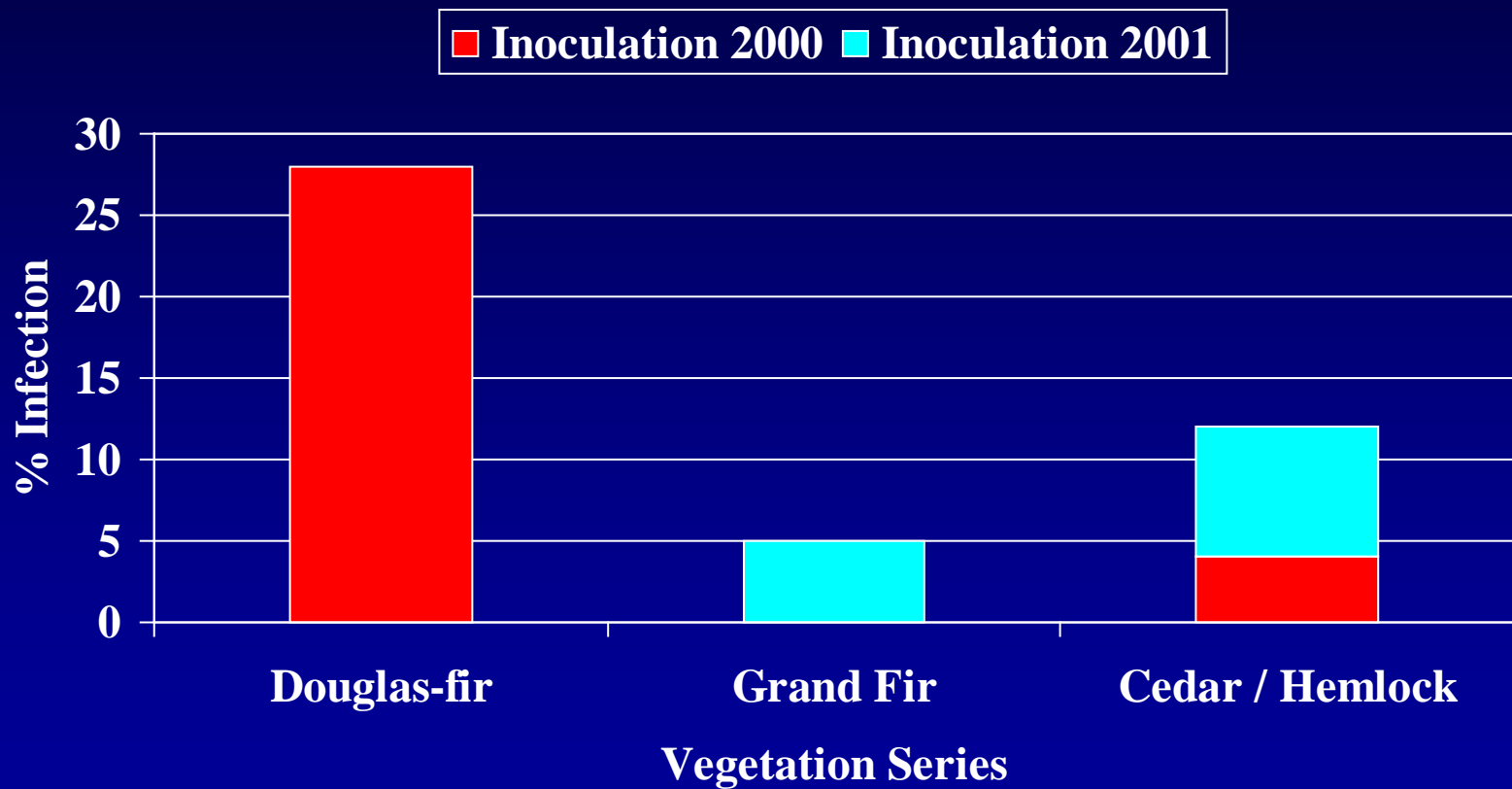
# Infection Results by Installation

2000 Inoculation

2001 Inoculation

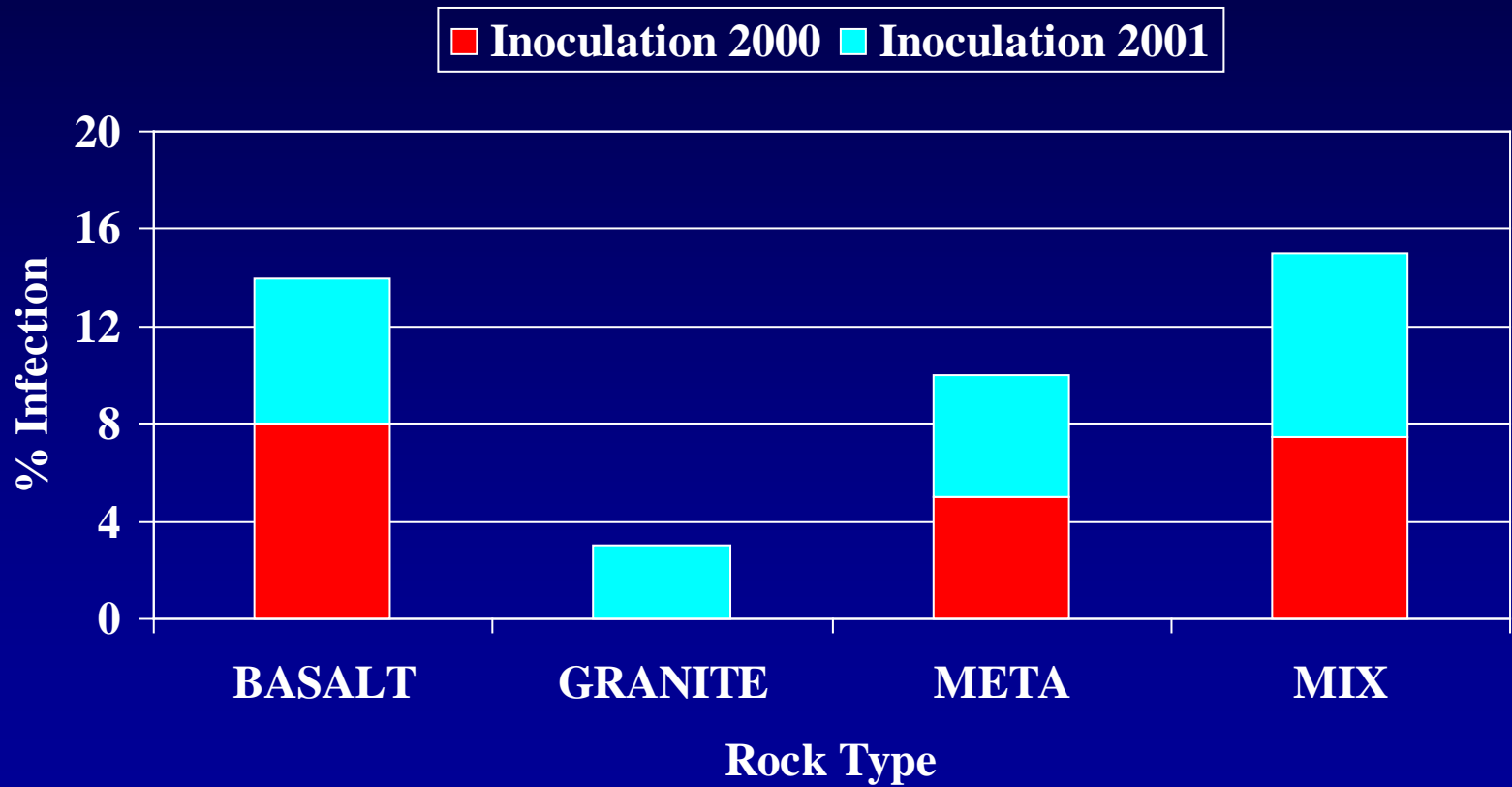
Site / Region	Infection	Site / Region	Infection
Bovill - NID	6	Spirit Lake - NID	7
Enterprise - NEO	11	Grasshopper - NID	4
Huckleberry - NID	3	Upper Pataha - SEWA	3
Stanton - NID	0	Springdale - NEWA	0
Soldier Creek - NID	5	Whiskey Butte - NID	5
Furport - NEWA	4	Pivash - NID	5
Hanson - NEWA	8	Sportsman - NID	4
Haverland - NEWA	0	Skookum - NEWA	5
TOTAL	37	Dick's Creek - NID	5
		TOTAL	38

# % Infection by Vegetation Series

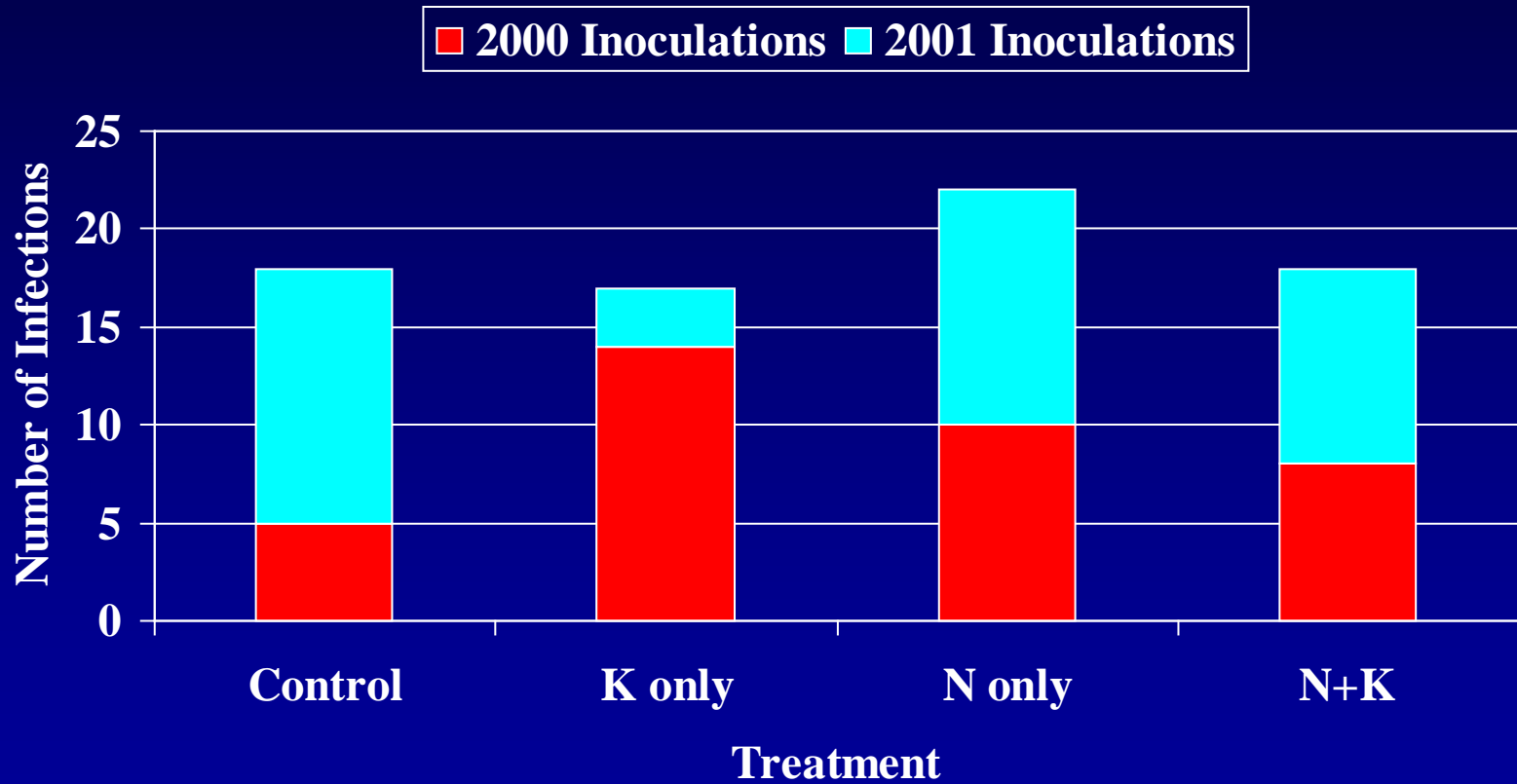




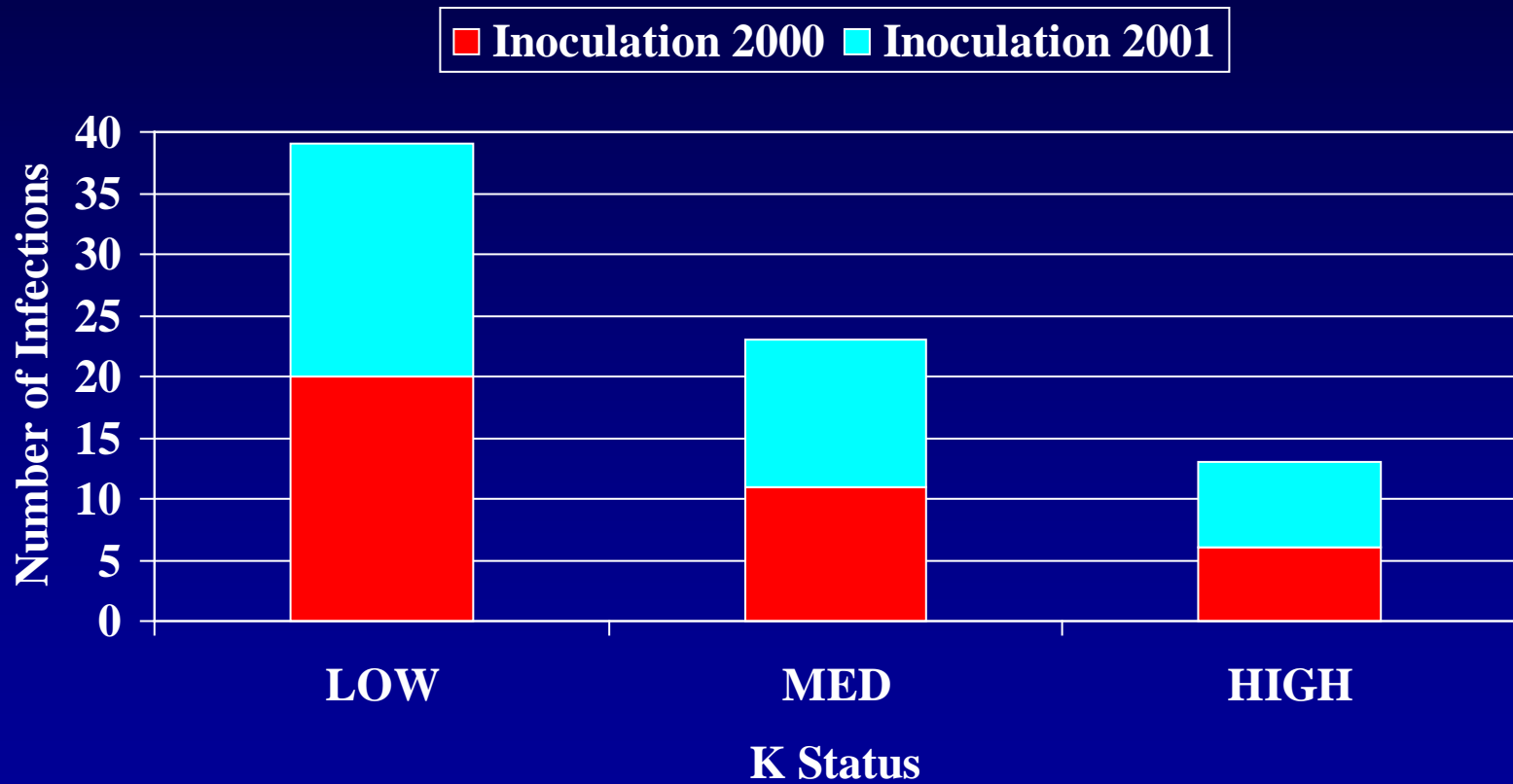
# % Infection by Rock Type



# Infection by Treatment



# Infection by Foliar K Status



# IFTNC Root Chemistry

Field root bark collection



Freeze-drying samples



Freeze-dried sample



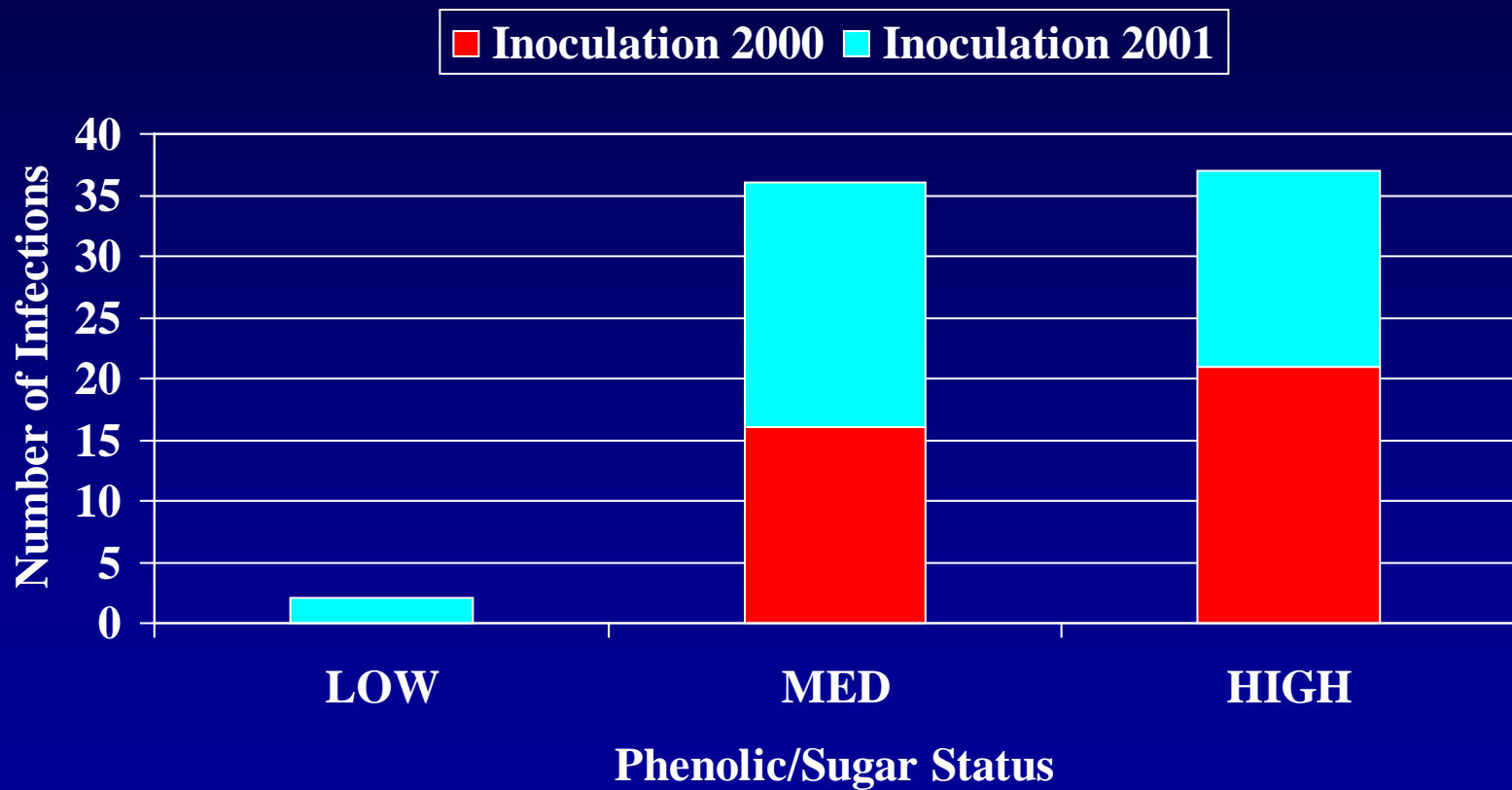
Outer Bark

Inner Bark

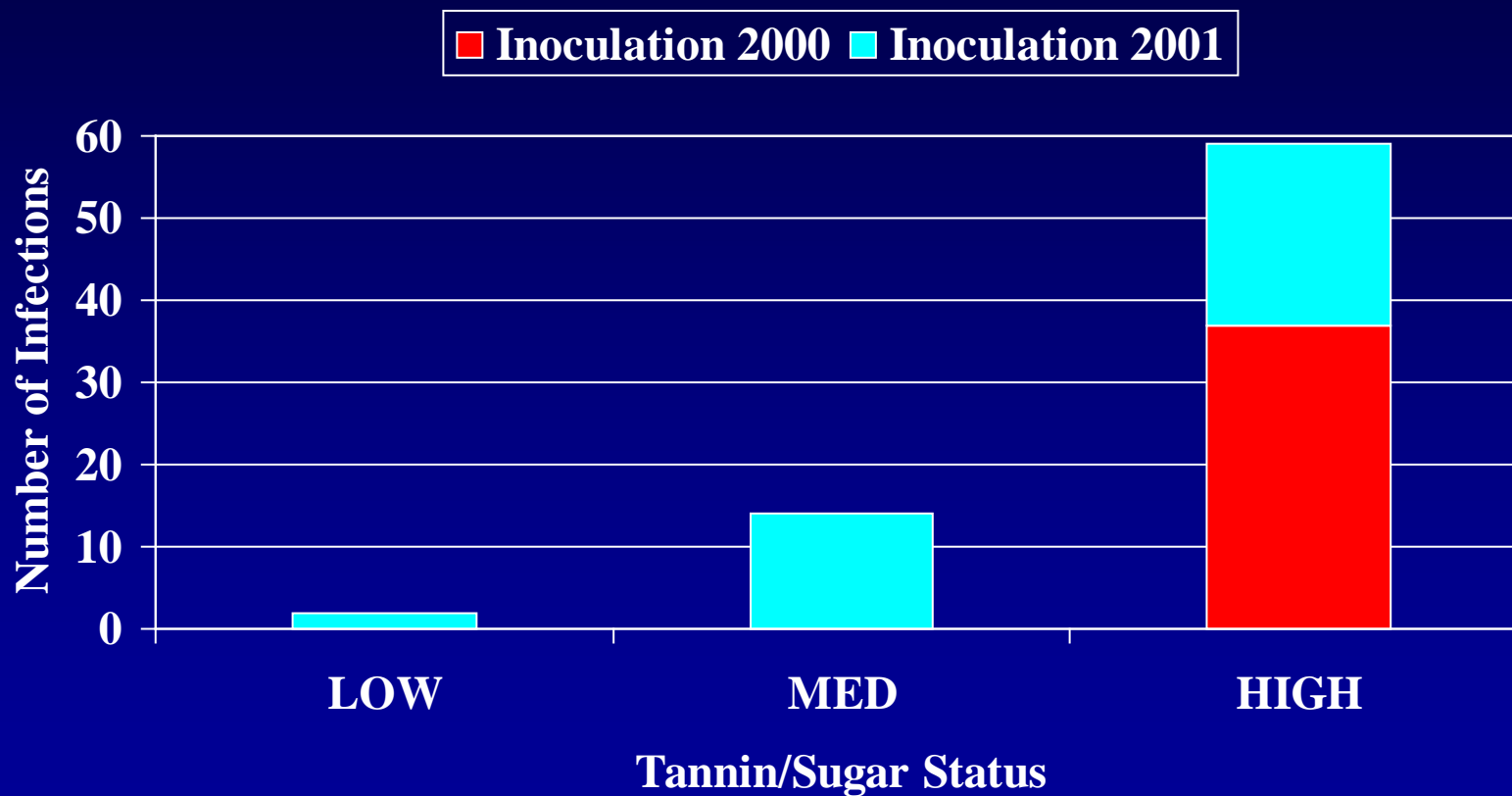
Root Chemistry



# Infection by Root Bark Phenolic/Sugar Status



# Infection by Root Bark Tannin/Sugar Status



# RECOGNITION AND THANKS

## USFS Forest Science Lab

John Hanna

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