

IFTNC

Forest Health Experiment

*A. ostoyae* Root Disease Inoculation



Terry M. Shaw



# Forest Health

## 1999-2000 *Armillaria* Collection Summary

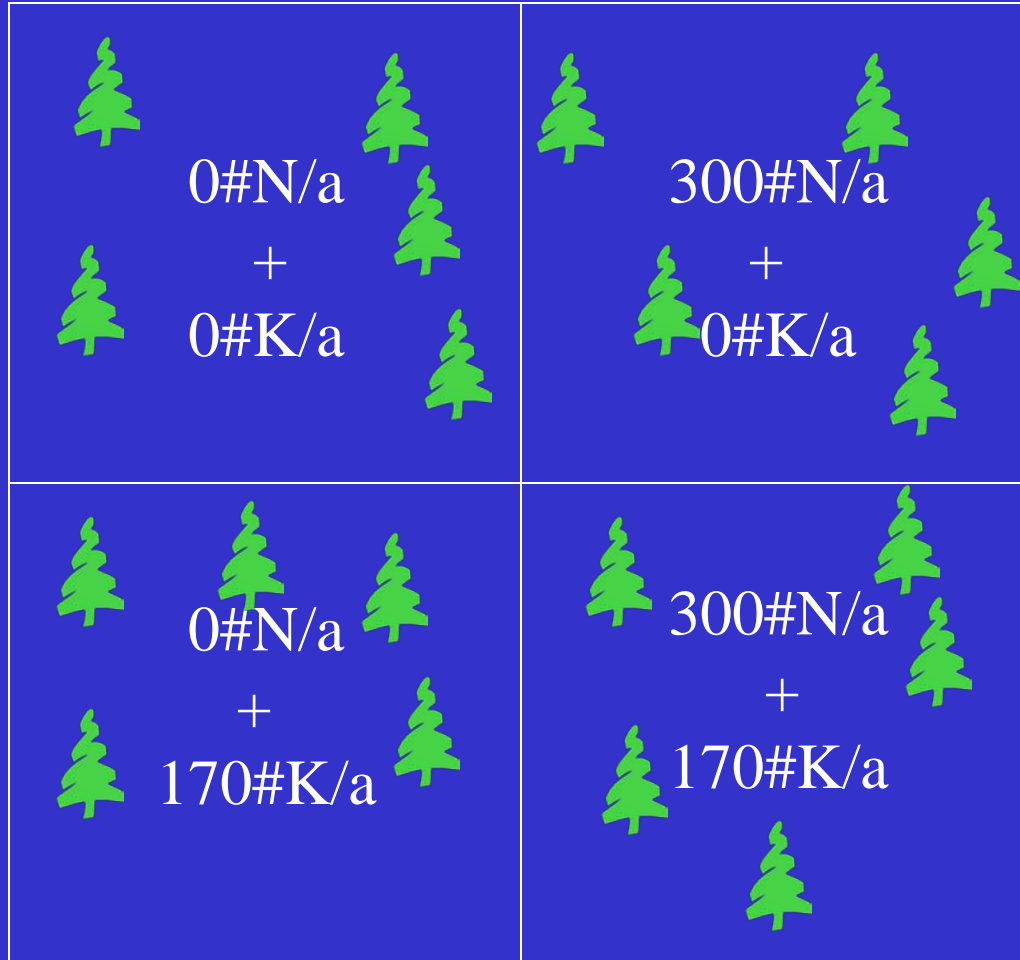
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Collection Year	1999	2000
Number of Sites	15	15
Number sites <i>Armillaria</i> collected	12	11
Number sites with <i>Armillaria ostoyae</i>	8	9

# Forest Health Core Treatment Design



## A. *ostoyae* Inoculation Design



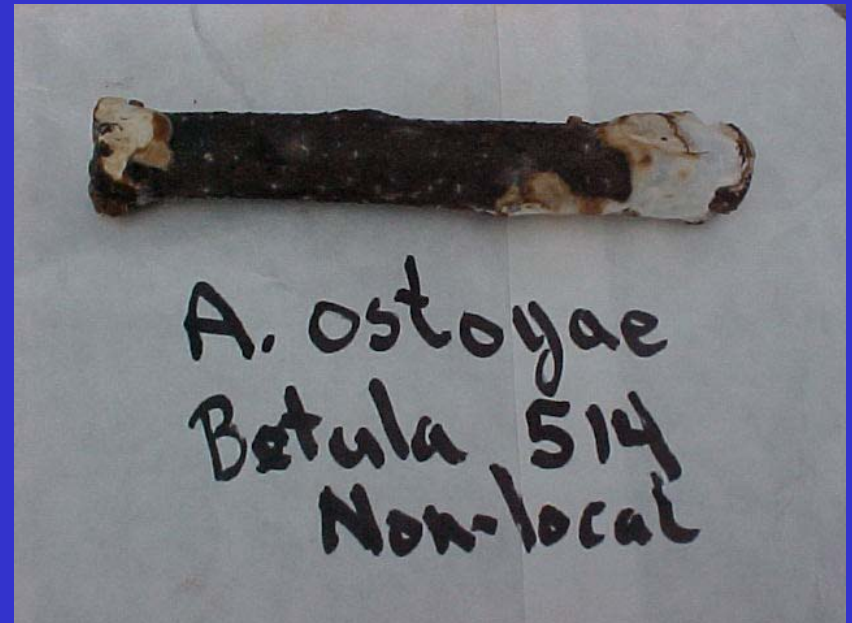
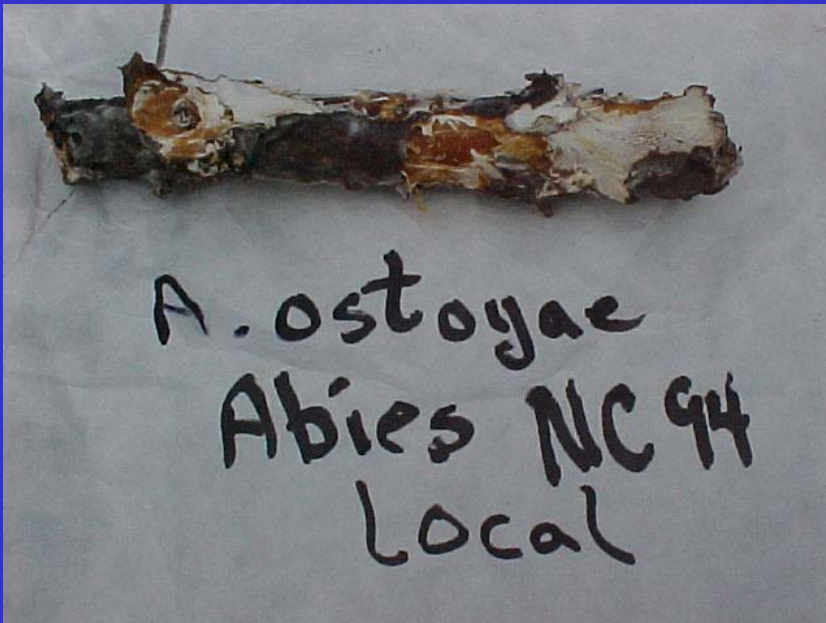
# Forest Health Root Inoculation



## Pathogenetic *A. ostoyae* Isolates

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



# Forest Health



## *Armillaria ostoyae* Inoculation

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Each tree received one local isolate and one regional isolate.



Five trees per plot were inoculated



Excavation and attachment

Finished product



# Forest Health *Amillaria ostoyae* Inoculation by Region



Regions					
SC WA	NC WA	NE WA	N ID	C ID	NE OR
0 (4)	0 (2)	6 (6)	9 (12)	0 (4)	2 (2)

# Forest Health

## *Armillaria ostoyae* Inoculation by Vegetation and Rock Type



	Douglas-fir	Grand fir	Cedar/Hemlock	Total
Granite	0 (3)	2 (3)	1 (2)	3 (8)
Basalt	1 (3)	1 (3)	3 (3)	5 (9)
Meta-Sed	0 (0)	1 (1)	4 (4)	5 (5)
Mix	0 (2)	1 (3)	3 (3)	4 (8)
Total	1 (8)	5 (10)	11 (12)	17 (30)



# Forest Health *A. ostoyae* Groups

based on IGS-1 region sequences



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- Group A - most common type in NW
  - Group B - Rare
  - Group C - Rare
  
  - Hybrid Combinations
    - Groups A x B - very common
    - Groups A x C - less common (**Regional Isolate**)



# Forest Health *Amillaria ostoyae* Groups by Region



Regions		
NE WA	N ID	NE OR
Group A (4)	Group A (4)	
Hybrid AxB (1)	Hybrid AxB (4)	Group A (1)
Hybrid AxC (1)	Hybrid AxC (1)	Hybrid AxB (1)



# Forest Health *Armillaria ostoyae* Groups by Vegetation and Rock Type

	Douglas-fir	Grand fir	Cedar/Hemlock	Total
Granite	0	Group A (1) Hybrid AxC (1)	Group A (1)	Group A (2) Hybrid AxC (1)
Basalt	Hybrid AxB (1)	Group A (1)	Group A (1) Hybrid AxB (1) Hybrid AxC (1)	Group A (2) Hybrid AxB(2) Hybrid AxC (1)
Meta-Sed	0	Group A (1)	Group A (1) Hybrid AxB (3)	Group A (2) Hybrid AxB (3)
Mix	0	Group A (1)	Group A (2) Hybrid AxB (1)	Group A (3) Hybrid AxB (1)
Total	Hybrid AxB (1)	Group A (4) Hybrid AxC (1)	Group A (5) Hybrid AxB (5) Hybrid AxC (1)	Group A (9) Hybrid AxB (6) Hybrid AxC (2)

# Forest Health



## Genetic Diversity of *A. ostoyae* Inoculations

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- All but one site (Enterprise 337) received regional genet group AxC hybrid
  - Group A (9)
  - Group AxB (6)
  - Group AxC (2)
- Both genets at Enterprise are group AxB hybrids
- Both genets at Springdale (346) are group AxC hybrids

# Forest Health

2002 *Armillaria ostoyae*

Verification of Infection



- Stage I
  - Field excavation and removal
- Stage II
  - Incidence of infection
- Stage III
  - Isolate Verification

# Forest Health

## Root Bark and *A. ostoyae* Inoculation Time Table

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- 1998 root bark collection 1994 installations
- 1999-2000 collect and colonize *A. spp.* isolates
- 2000-2001 collect and colonize *A. spp.* isolates
- Fall/2000 inoculate Forest Health sites with *A. ostoyae* and collect root bark
- Fall/2001 inoculate Forest Health sites with *A. ostoyae* and collect root bark
- Fall/2002 verify *A. ostoyae* infection
- Fall/2003 verify *A. ostoyae* infection