



Forest Service  
U.S. DEPARTMENT OF AGRICULTURE



# Hello!

## I am Charlie Barnes

Plant Pathologist  
US Forest Service  
Southern California Shared Service Area





# My Rust Background

## Past work

- USDA-ARS-Developed assays to quantify wheat and soybean rust fungal spores in rain
- Worked in Ecuador on rusts of cereals, coffee, peach, fig

## Current work

- Updated Rust section for the Forest Service Insect and Disease Manual





# White Pine Blister Rust

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White pines, *Cronartium ribicola* and *Ribes* spp.

# Outline

- What is “blister” rust?
- Where it came from, where it is?
- Disease cycle: good for thinking about control, movement, where it’s coming from or going to





# White Pine



# Blister



# Rust





# Pinyon



# Blister

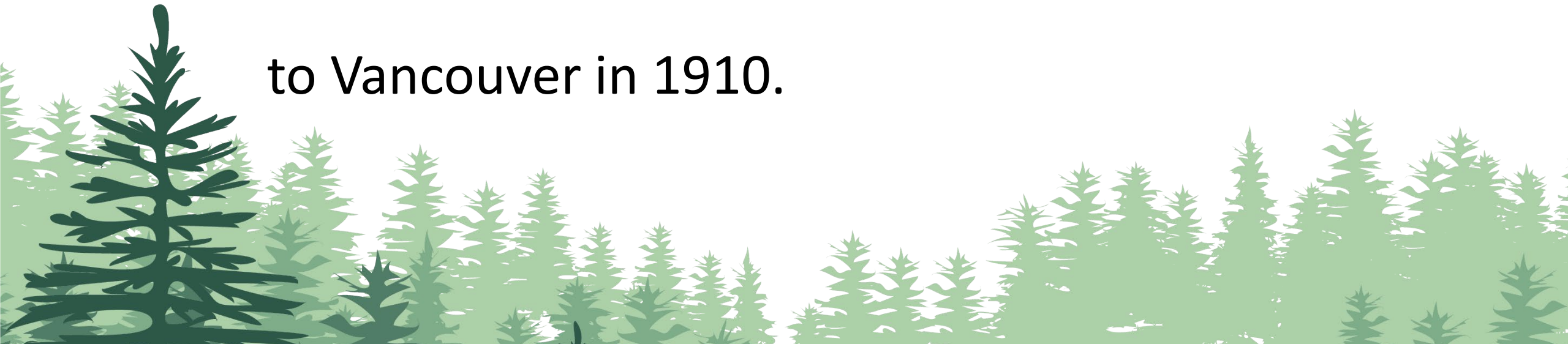


# Rust



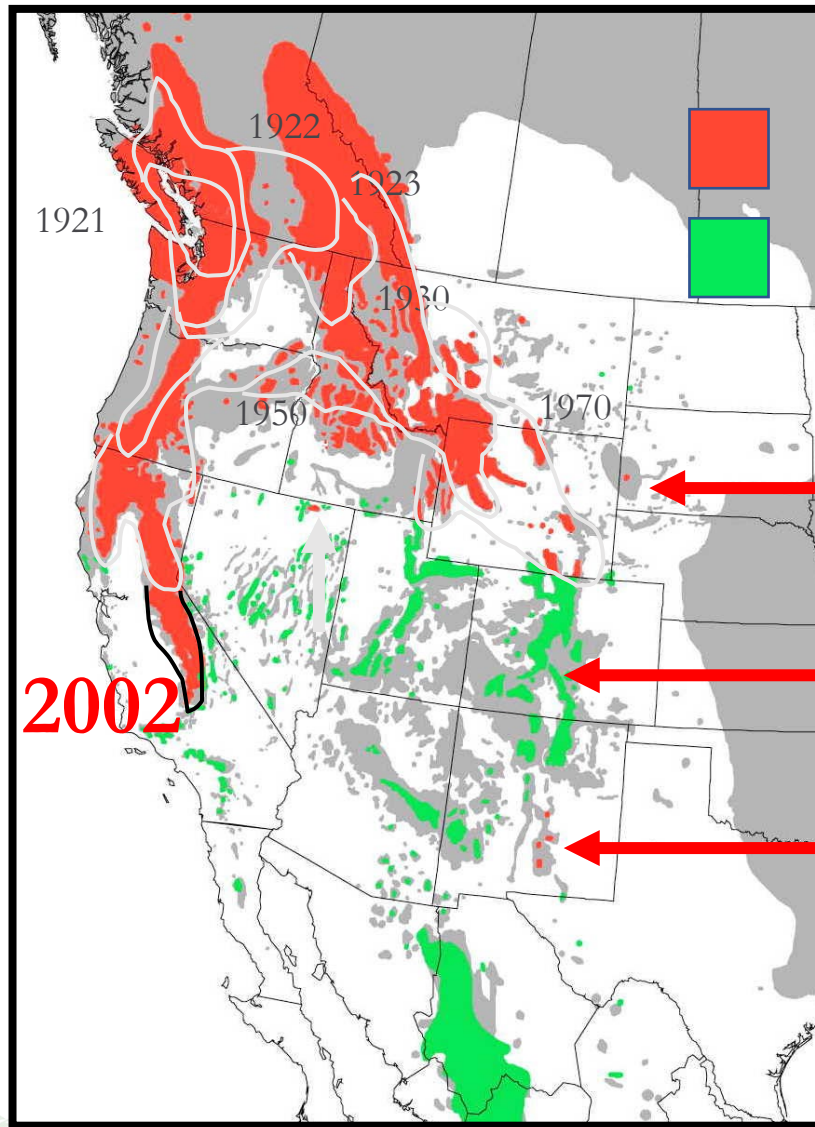
## ***Cronartium ribicola* (cause of WPBR)**

- Endemic to central Siberia, south to Himalayas
- White pines brought to Europe for ship masts 1705
- WP seedlings sold back to NA. WPBR low in 1890s, eastern outbreak in 1906, WP seedlings from France to Vancouver in 1910.





# White pine blister rust



Infected 5-needle pines

Disease free

2000+

2004- Bristlecone pine

1998 southwestern white pine

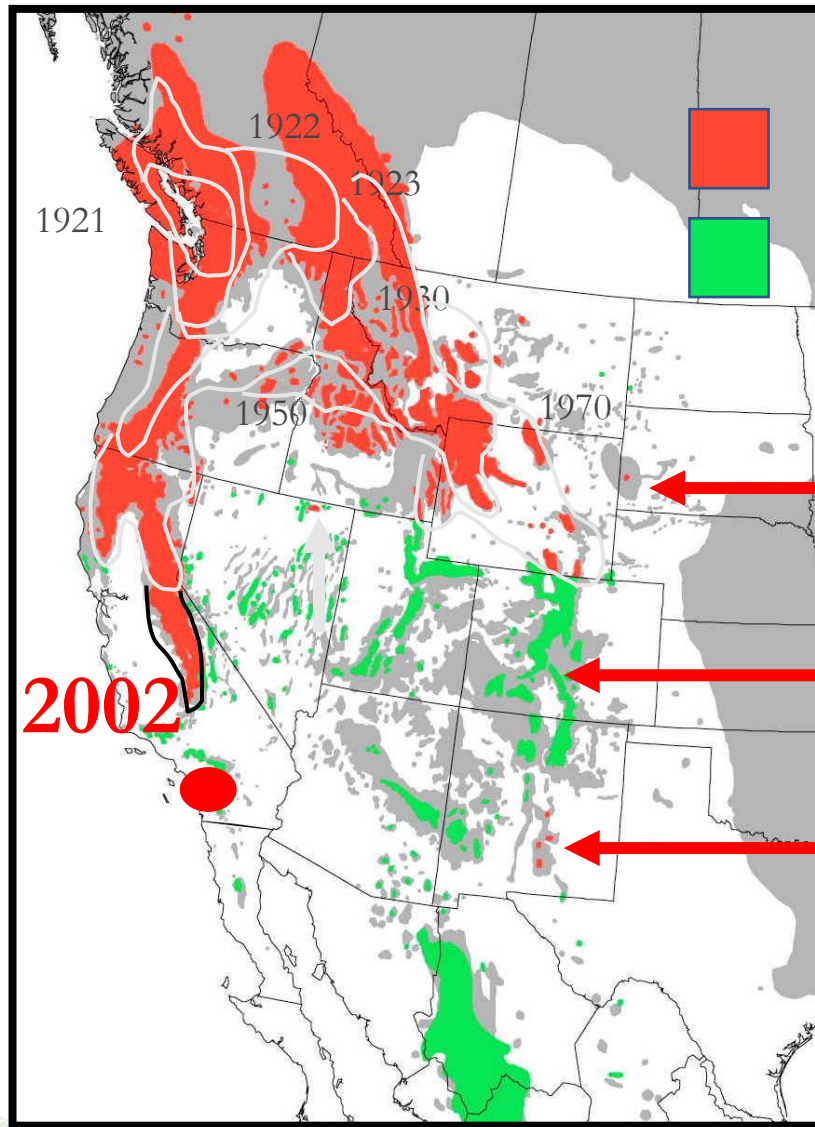
2002

Breckenridge Mtn in 2002-east of Bakersfield



# White pine blister rust

● New WPBR on *Ribes*



WPBR 5-needle pine rust

Disease free

2000+

2004- Bristlecone pine

1998 southwestern white pine

2002

Breckenridge Mtn in 2002-east of Bakersfield

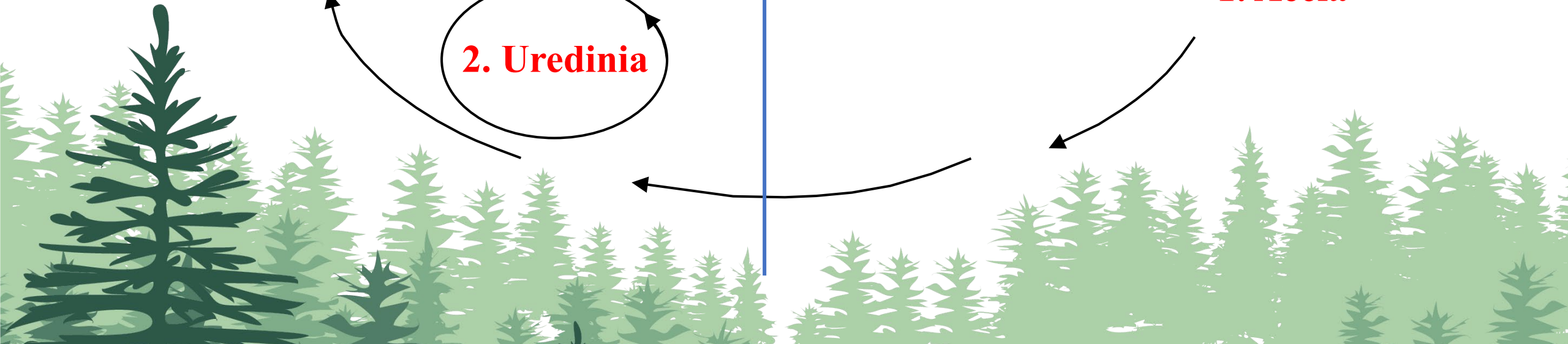
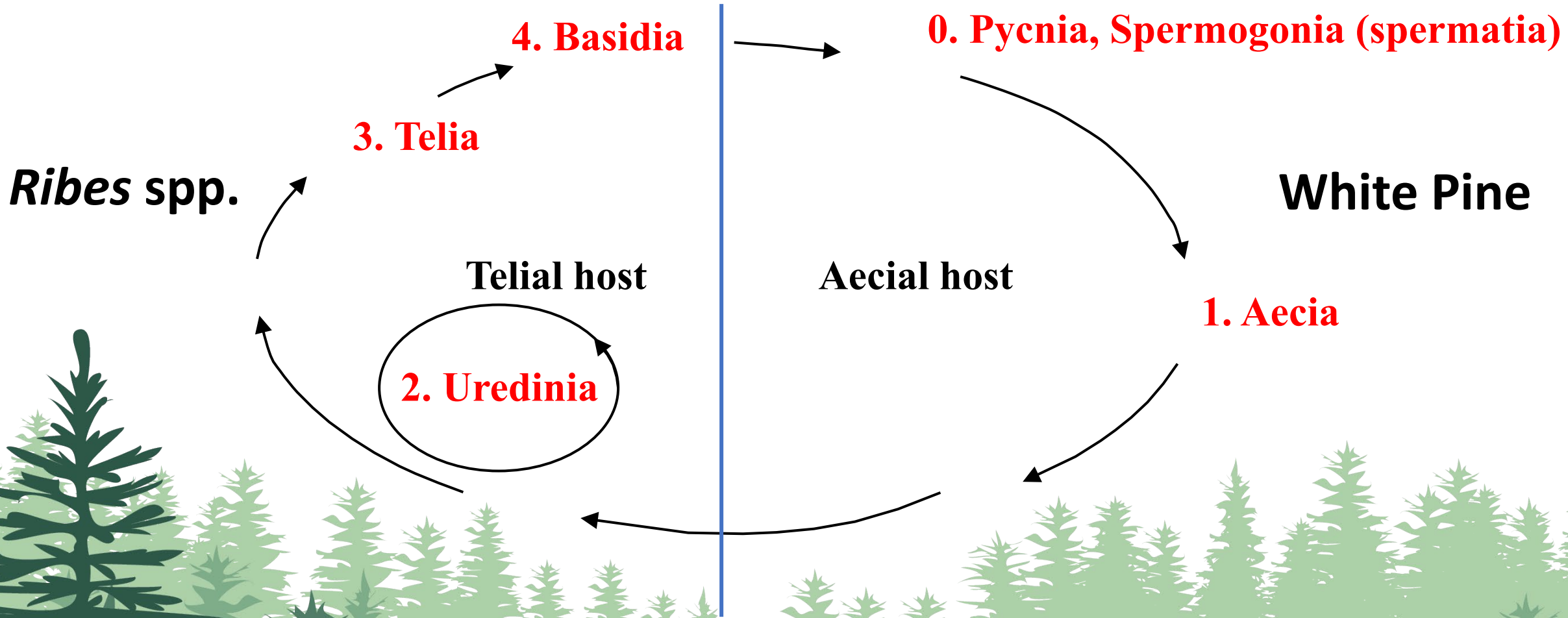
# 1<sup>st</sup> Sighting

- November 2021
- 150 miles to the south
- Verified by DNA sequence





# Life Cycle of Rust Fungi (cont)



# *Ribes* spp.



2-5  
years

White Pine

Fall  
Telial host

Aecial host



All  
summer





# California White Pine Hosts



Western White



Sugar



Whitebark



Bristlecone



Limber



Foxtail



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# California *Ribes* spp. Hosts

**Most**





# The 9 tree rusts of California

1 host



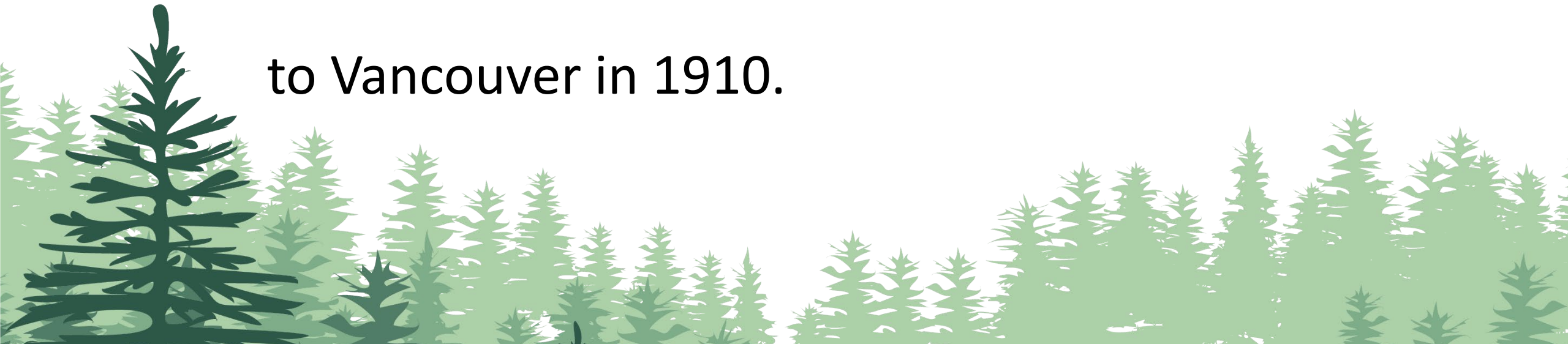
1. White Pine Blister Rust *Cronartium ribicola*
2. Western Gall Rust *Cronartium harknessii* (*Peridermium harknessii*)
3. Stalactiform Rust *Cronartium coleosporioides*
4. Comandra Rust *Cronartium comandrae*
5. Pinyon Blister Rust *Cronartium occidentale*
6. Pinyon Needle Rust *Coleosporium jonesii*
7. Filamentosum Rust *Peridermium filamentosum*
8. Fir Broom Rust *Melampsorella caryophyllacearum*
9. Incense-cedar Broom Rust *Gymnotelium blasdaleanum*

Telial host



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# Thank you

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