



GRAND FIR AND BALSAM WOOLLY ADELGID IN CALIFORNIA

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CFPC NOVEMBER 19TH, 2020



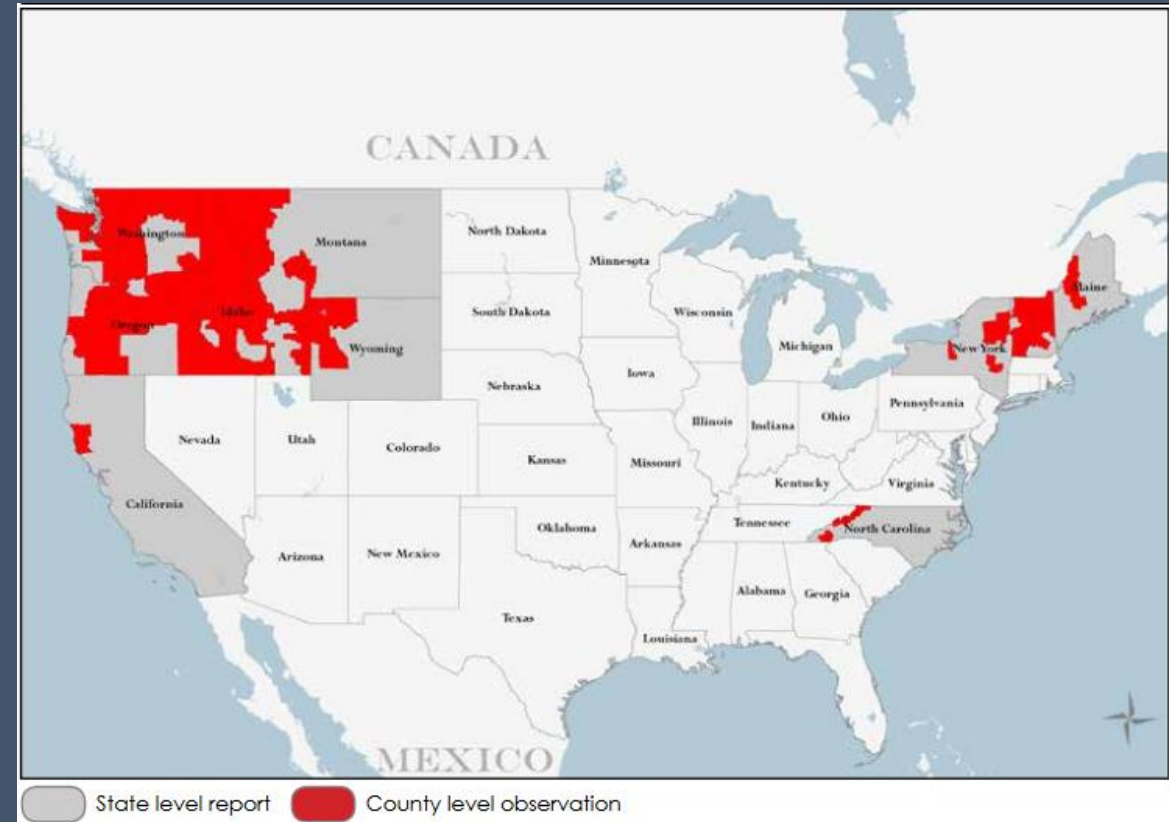
UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources



BALSAM WOOLLY ADELGID (BWA)

ADELGES PICEAE RATZEBURG (HEMIPTERA: ADELGIDAE)

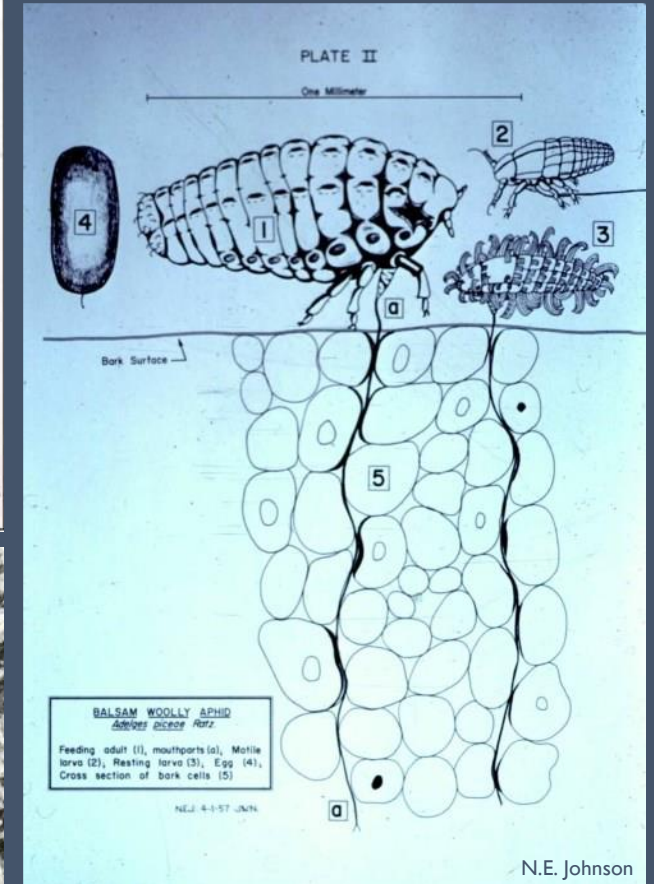
- Invasive
- First detected in eastern NA in 1900
 - balsam fir, Fraser fir
- Detected in western NA in 1928
 - grand fir, noble fir, European silver fir, Pacific silver fir, subalpine fir
- Hosts: All true firs (*Abies* spp.) in NA



USDA Forest Service, Northern Research Station and Forest Health Protection. "Alien Forest Pest Explorer - species map." Database last updated 25 March 2019. <<https://www.nrs.fs.fed.us/tools/afpe/maps/>> (5/28/2019)

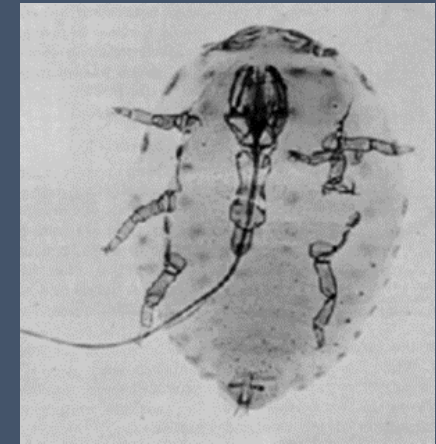
BWA CHARACTERISTICS

- Tiny wingless insect (~1 mm)
- Piercing/sucking mouthparts
 - Inject toxic saliva that damages vascular tissues
- Mostly immobile
- Excretes waxy wool-like substance
- Infests stems and twigs (100-200 adelgids/in²)
- Disperse by wind and birds



BWA LIFE CYCLE IN NA

- Parthenogenetic
- 3-5 generations



SYMPTOMS OF INFESTATION

- Gouting
 - swelling at bud and branch nodes
- Branch deformities
 - Stunted growth, top-curl
- Crown thinning
- Stem infestation
- Irregular growth rings (rotholz)



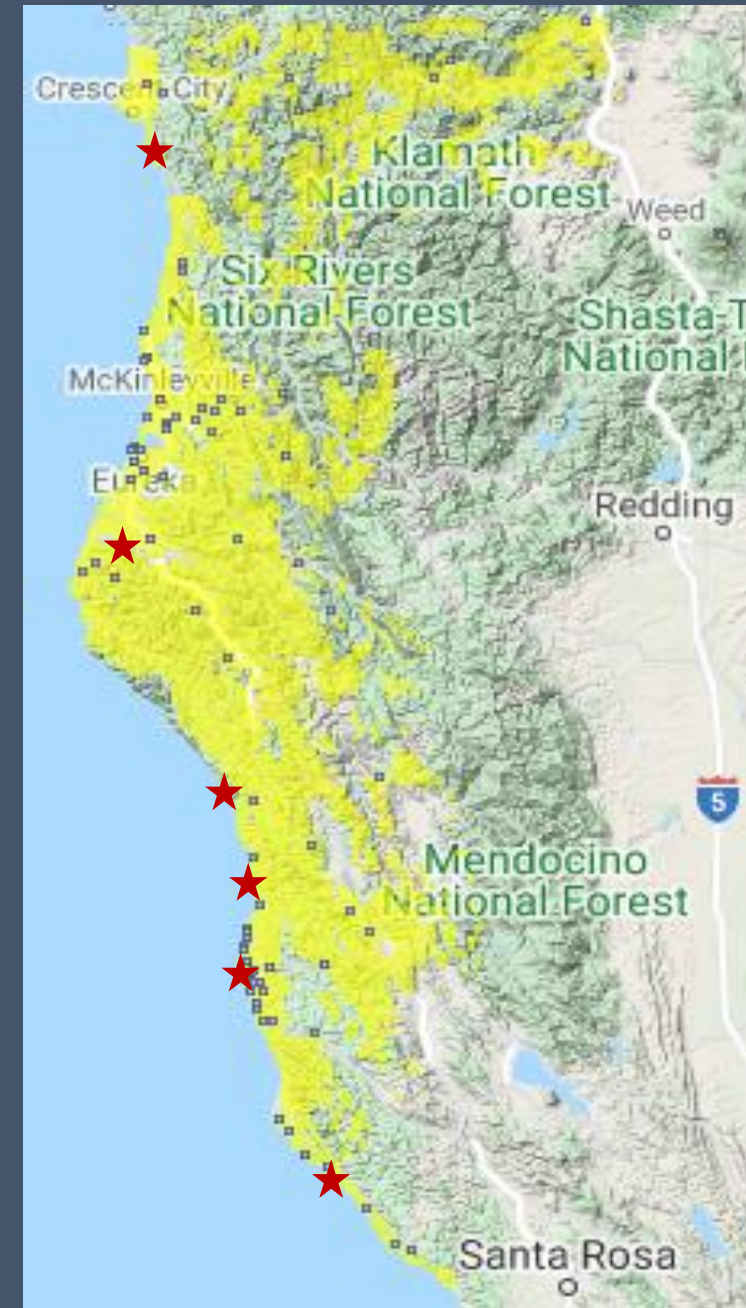
CA INFESTATION

- 1928 – BWA first detected in SF
- ~2012 – grand fir mortality observed near Fort Bragg
- ~2017 – BWA detected near Fortuna



BWA RESEARCH

- What is BWA doing in CA?
- Established study sites along the range of grand fir on the coast







FOREST HEALTH ISSUES

- Heterobasidion
- Armillaria
- Ganoderma



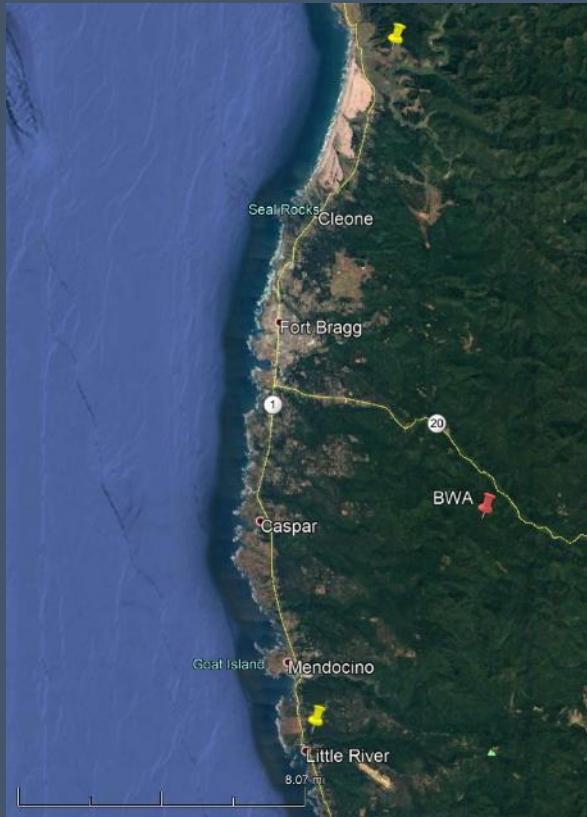
FOREST HEALTH ISSUES

- Bark beetles



BWA INFESTATION

- It's everywhere



BWA PHENOLOGY



April



November

Asa Spade

THANK YOU

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David McLean

Ryan Keiffer

Funding:

US Forest Service EM Grant

