



**sappi**

Inspired by life

**The 54th Annual Meeting  
Western Region of North America  
and International Tour  
Portland, OR**

**Craig Ford**

# Talk Overview

- Nurseries visited
- Containers used in propagation
- Growing media
- Sowing process
- Rooted cuttings
- Growing environments
- Irrigation
- Fertiliser
- Dispatch
- Quality control
- Seedling storage
- Nuggets of knowledge
- Conclusions



*One of the main constraints in the propagation industry the Pacific North West was the labour force.*

# Nurseries Visited

## Webster Forestry Nursery – Olympia

Conifers (~30 species)  
10mil Container seedlings pa

## Weyerhaeuser – Rochester

Conifers (36 species)  
13mil Container seedlings pa  
18 container types

## Bailey Nurseries – Ornamental Nursery

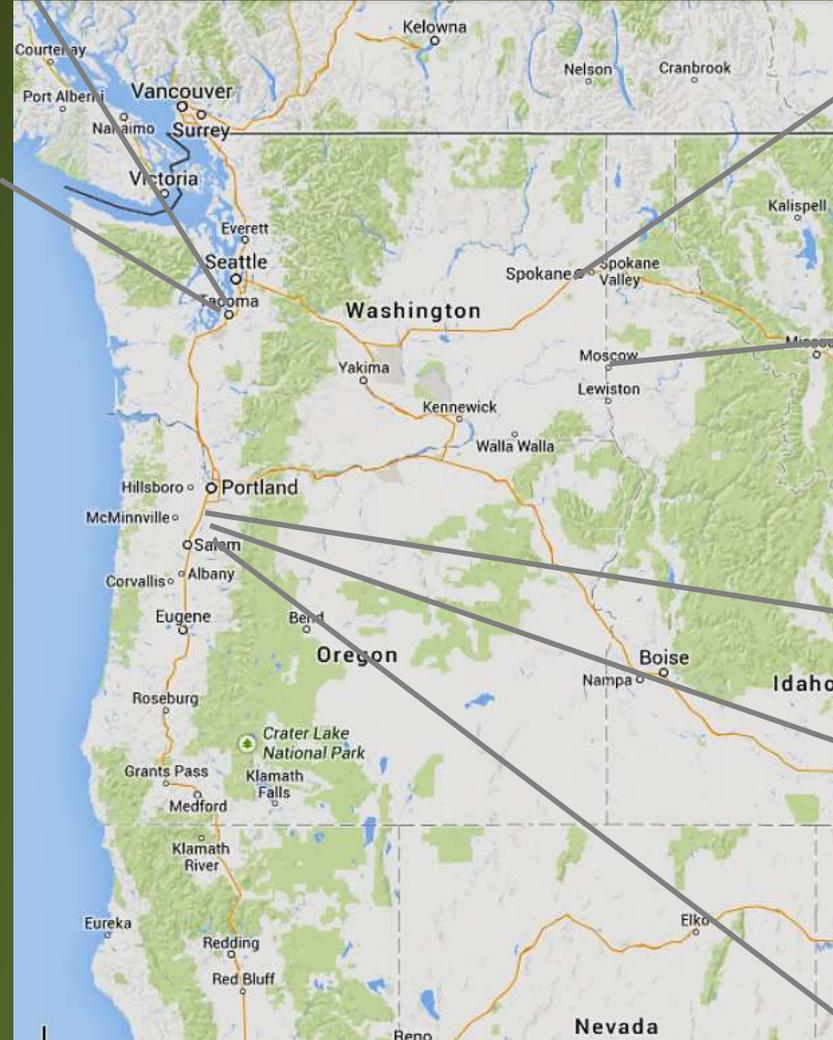
## USDA Germplasm Repository – Laboratory and Nursery

## Oregon Flowers – Cut Flower growers

## J Frank Schmidt – Ornamentals and shrubs

## Sester Farms - Conifers, ornamental and deciduous tree and shrub nursery

## Porterhouse Conifer Arboretum



## Coeur d' Alene – USDA

Conifers and native plants (200+ species)  
4mil Container seedlings pa  
16mil Bareroot seedlings

## Pitkin Forest Nursery – University of Idaho Research Nursery (Self funding)

Conifers (70 species)  
1mil Container seedlings sold pa

## Weyerhaeuser - Canby

Conifers (40 species)  
28mil Bareroot seedlings sold pa  
35mil Bareroot seedlings kept in stock

## IFA Nurseries – Aurora

Conifers (10-15 species)  
3mil Container seedlings pa for outplanting  
10mil Container seedlings pa for transplanting into beds

## PRT Nurseries – Aurora

Conifers (~20 species)  
15-20mil Container seedlings pa  
[PRT – 180mil seedlings PA]

# Containers



# Containers



Ray Leach containers



# Containers





Most nurseries use hot water baths to sterilise trays at about 80°C



IFA run trays through high pressure jets to clean, then sterilise trays at 180°F (82°C) before packing and storing. Trays are then steam sterilised before use



# Forestry Media

All container nurseries used Sphagnum Peat Moss as their media base (Mostly Canadian, ey)

Two main variations in the media additives:

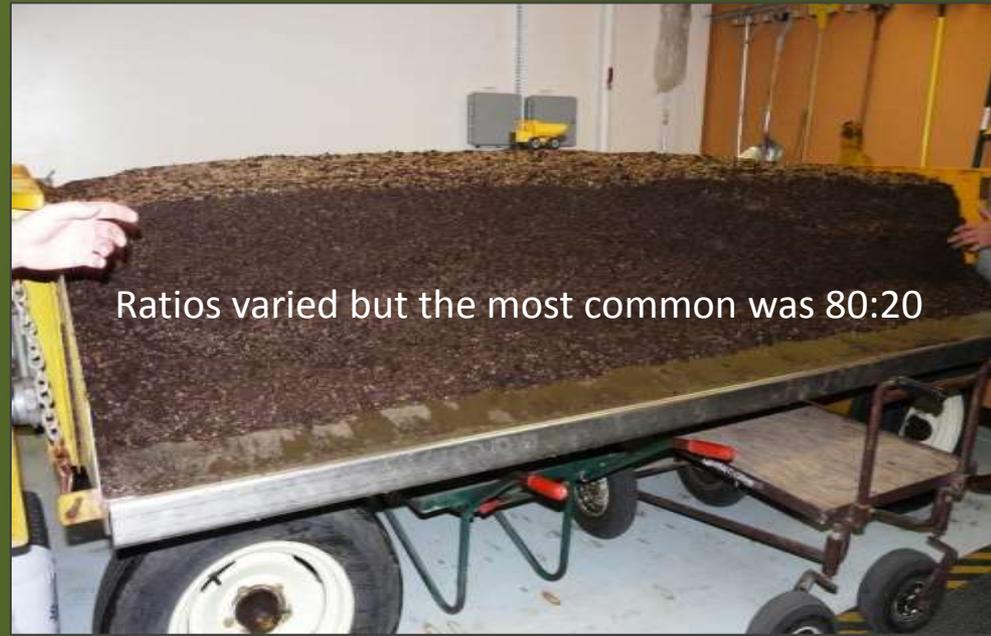
**Perlite** = light weight, consistent, *expensive, floats, dust issues*

**Pumice** = local, cheap, low compressibility, low dust, *heavy, inconsistent*



Forestry #1  
SKU: 2353907 2.8 CFL  
LOT CODE: H10300B  
INGREDIENTS:  
45%-55% Canadian Sphagnum  
peat moss and vermiculite  
Custom Blend

Adding control release fertiliser in media is common



# General Media



- Growing media combinations:
  - peat:bark:pumice (5:2:2) (Bailey's)
  - pumice: peat: loam (5:4:1) (USDA Germ)
  - Fine bark:peat:perilte for TC plants (J Frank Schmidt)



Oregon Flowers re-used peat media and included chopped bulbs. Media was steam sterilised

It was not sowing season, for forestry, so most equipment was in storage but systems are very similar to our own

# Sowing



Peat media requires compacting, most nurseries have “thumpers”/shakers (some modified from the canning industry)

# Sowing

Use of grit capping was common across all nurseries

- Retains moisture
- Retains heat (insulates)
- Can absorb/reflect solar energy
- Suppresses weed growth



2yr old White Bark Pine seedlings





# Rooted Cuttings

- Bare root system
- rooting in pumice/bark beds with overhead boom irrigation
- no misting
- No longer dip cuttings in rooting hormone, spray on stock



# Growing Environment



Coeur d'Alene Nursery, USDA



IFA Canby Nursery



PRT Aurora Nursery



Webster Forestry Nursery, Olympia

# Growing Environment



# Growing Environment

Most nurseries had roller systems for moving trays to save on labour costs and for ergonomic improvements



PRT had temporary structures for flexibility (and cost saving)



Rehabilitation of former cut flower nursery, on a budget!

# Growing Environment



- Reduced staff required for handling trays from 6 to 2
- No need for isles
- No change in fertiliser or water but increased capacity from 2500 trays to 3500 per section
- Each 'table' is 18ft long and can support 1200lbs

# Growing Environment



# Heating

# Growing Environment



# Cooling

# Growing Environment



# Irrigation



# Irrigation



# Fertiliser



Fertigation is in addition to control release fertilisers in the media, for most

# Dispatch



## PRT screening process



## Quality Control



# Storage

Nursery nutrient and watering stresses (even light stress) induces bud set and dormancy allowing for long term cold storage



# Storage



# Nuggets of knowledge



# Nuggets of knowledge





# Nuggets of knowledge

- Customised equipment/ trolley used for setting in beds
- Rolling work seat
- Liverwort control by dusting on baking soda (don't wash in)

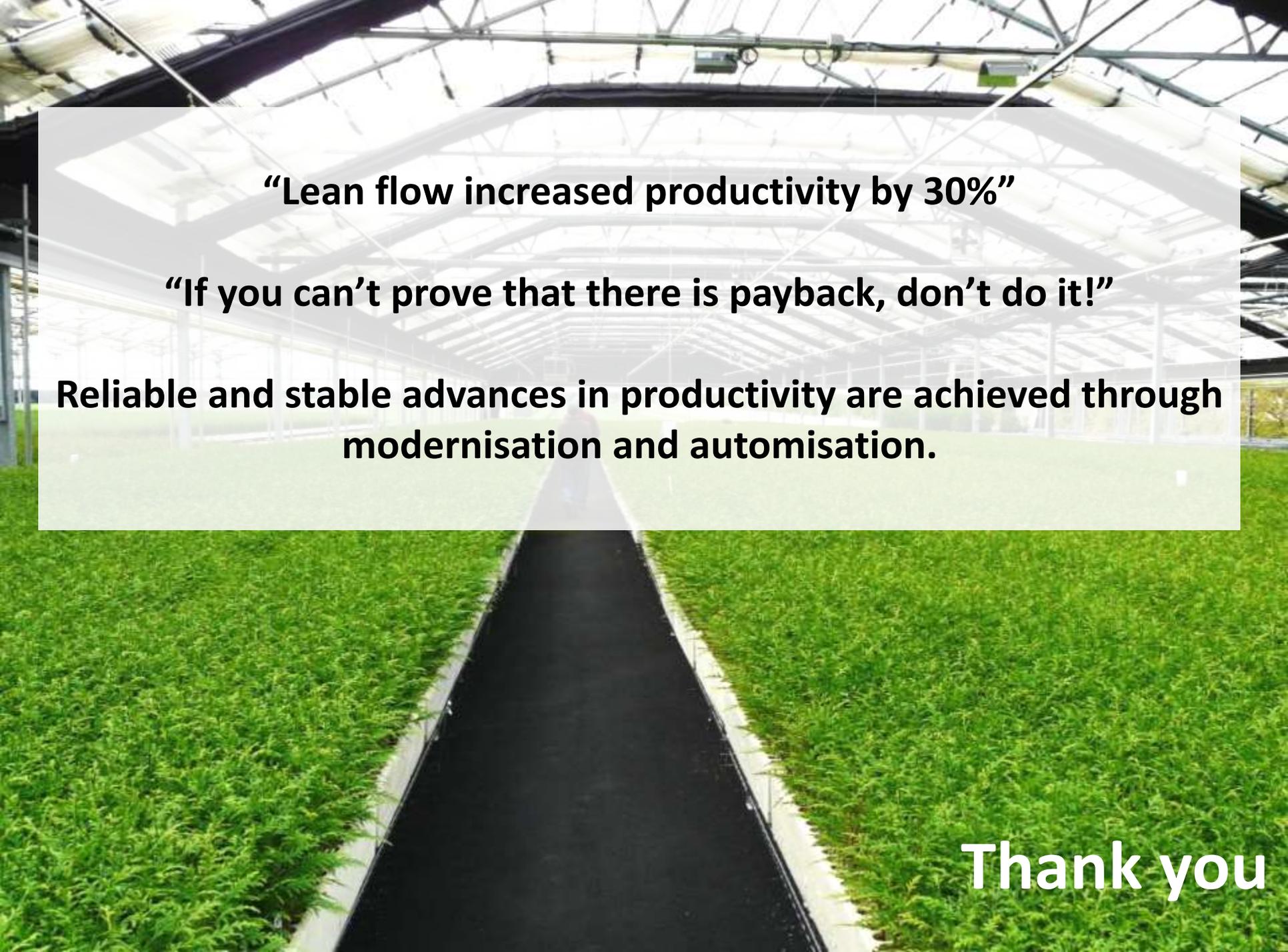




# Nuggets of knowledge



Trialling rooting under LED lighting – using a converted refrigeration container and humidifier



**“Lean flow increased productivity by 30%”**

**“If you can’t prove that there is payback, don’t do it!”**

**Reliable and stable advances in productivity are achieved through modernisation and automisation.**

**Thank you**