



# GROWING DAY-NEUTRAL STRAWBERRIES IN CENTRAL OREGON

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# Day-neutral strawberries

- Flower regardless of day length, when temps are 40-85°F
- Produce fruit in the first year
- Fruit throughout the growing season, dip during hottest weather
- Planted ~12" apart, beds spaced 3-4ft, often planted in plastic mulch
- Managed as 'mother plants' by removing runners
- Grown for 2 years (Central Oregon)








# Conditions in Central Oregon

- Average precipitation ~10-12"/year
- Elevation range ~2000-4200 feet
- Plant Hardiness Zone 3-5
- Average growing season ~90 days
- Hard freezes in May and mid-October, frosts common in summer months
- Wide swing in temp b/w day and night
  - Premature budding and frost damage

<b>Location</b> 	<b>Average Growing Season (# days)</b>
<b>Bend</b>	80-90
<b>La Pine</b>	70-80
<b>Madras</b>	90-100
<b>Prineville</b>	80-90
<b>Redmond</b>	80-90
<b>Sisters</b>	75-85
<b>Sunriver</b>	70-80
<b>Warm Springs</b>	100-110

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# Hence the interest in High Tunnels!



# Berry Research Project: Objectives

- Compare multiple cultivars of day-neutral strawberries for suitability to Central Oregon
  - Plant growth, berry yield, berry quality
- Evaluate strawberry production in high tunnels and the open field
- ***Help growers decide whether berry production in Central OR is an economically viable enterprise***, and if high tunnels are a justified expense to increase profitability and fruit quality



# Berry Research Project: Methodology

- 4 cultivars of day-neutral strawberries

**Albion**



**Evie 2**



**Mara des Bois**



**Seascape**



# Berry Research Project: Methodology

- 4 cultivars of day-neutral strawberries

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**Seascape**



- Planted early May 2019 in high tunnel and field
- Yield and berry quality data collected for 2019 & 2020 growing seasons



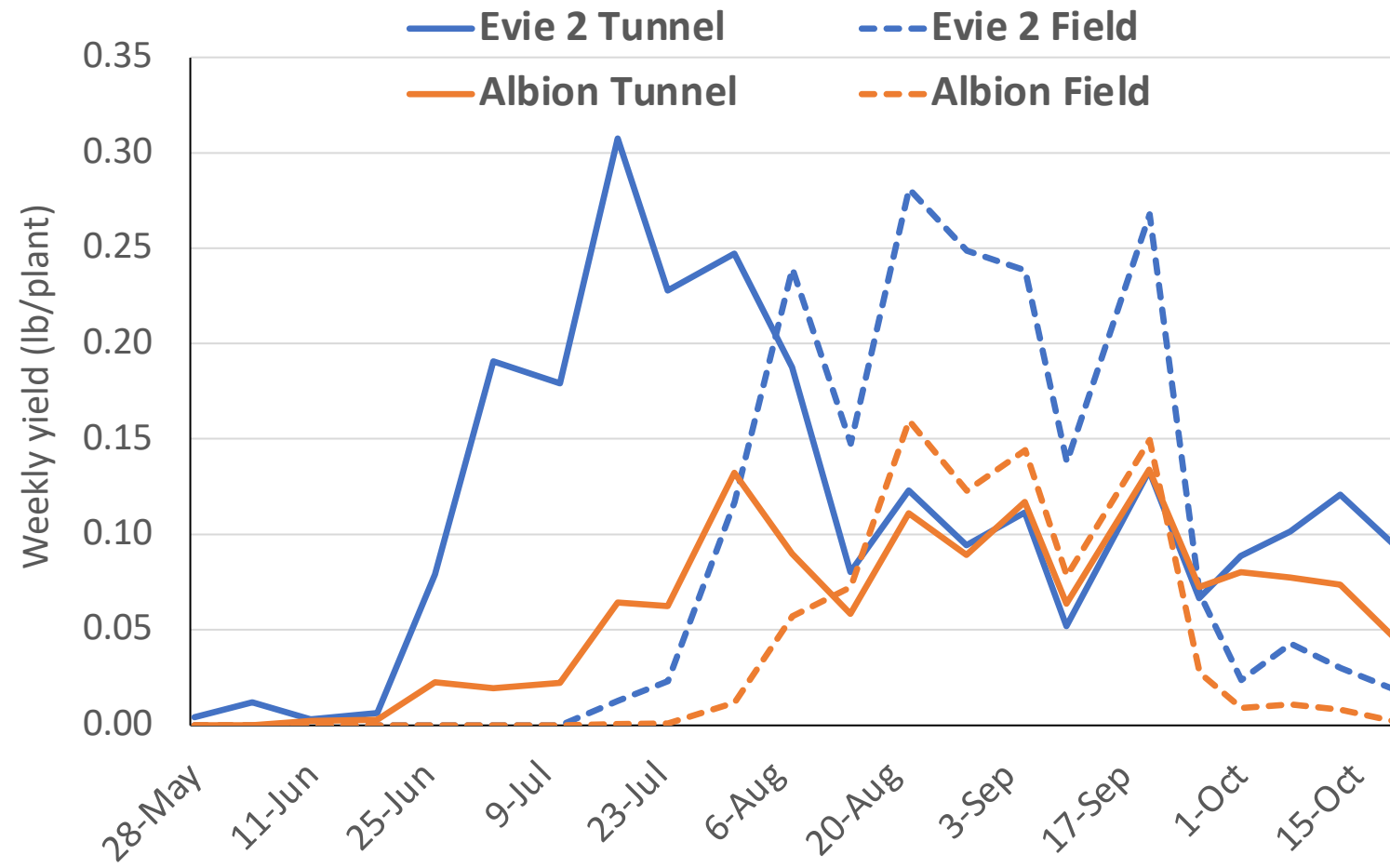
# Result Highlights

- Evie 2 highest yielding > Mara des Bois > Seascape > Albion
- Tunnel-grown plants had higher berry yields than field-grown plants
  - 2019: HT average 1lb/plant, Field average 0.8lb/plant
  - 2020: HT average 2.2lb/plant, Field average 1.5lb/plant
- 2019 growing season length similar between two growing systems
  - Harvest started in July, but peaked in late Aug/Sep
- 2020 growing season length was ~4-6 weeks longer in the high tunnel than the field, but varied by cultivar

# Yield and Quality Data

Cultivar and Year	Total marketable yield		Hight tunnel yield effect	Average fruit size <sup>1</sup>		Total % cull <sup>1</sup>	
	Field	Tunnel		Field	Tunnel	Field	Tunnel
<u>Year 1 - 2019</u>	lb/plant		% increase	g/berry		%	
Albion	0.6 b	0.8 b	44	14 a	16 a	6	6
Evie 2	1.0 a	1.4 a	46	13 b	14 b	6	5
Mara des Bois	0.9 a	0.9 b	6	6 c	8 d	7	7
Seascape	0.8 ab	0.9 b	9	12 b	12 c	6	4
<u>Year 2 - 2020</u>							
Albion	0.8 b	1.4 b	60	12 a	14 a	7 b	13
Evie 2	1.9 a	2.5 a	34	11 a	14 a	10 ab	17
Mara des Bois	1.6 ab	2.7 a	70	7 b	9 b	13 a	14
Seascape	1.5 ab	2.2 a	49	11 a	13 a	12 ab	13

# 2020 Weekly Harvest Profile

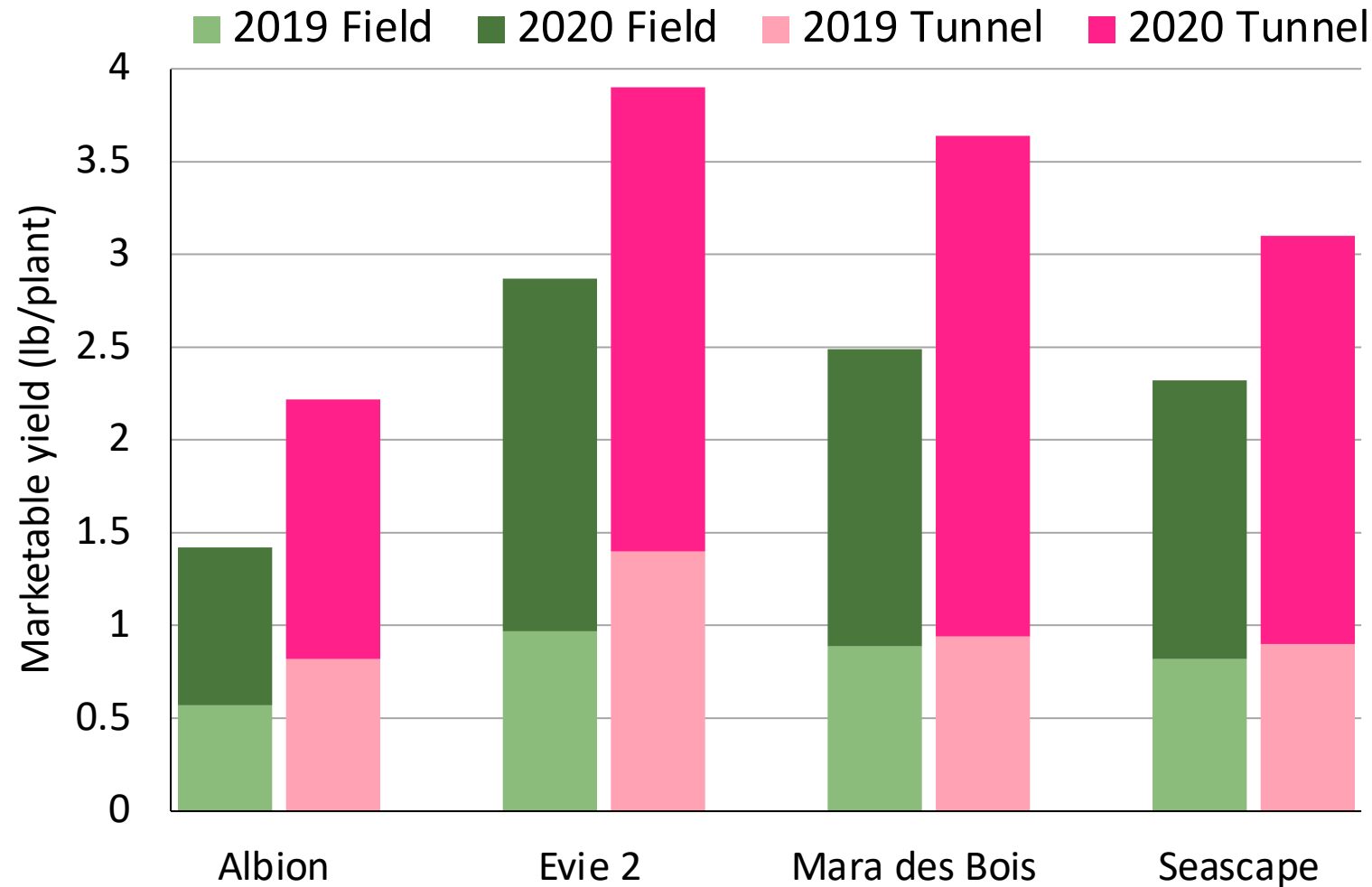


- HT production peaked late July, dipped in the hottest part of summer, and picked up again in early fall
- Field production peaked in mid-summer, providing a nice compliment to HT production
- Farmer could grow both systems to maintain production all season

# 2020 Effective Harvest Season (20% 'start' to 80% 'end')

Cultivar	System	July	August	September
Mara des Bois	Tunnel Field	Light green bar spanning July, August, and September.		
		Dark green bar spanning late July, August, and early September.		
Evie 2	Tunnel Field	Light blue bar spanning late July, August, and early September.		
		Dark blue bar spanning August and September.		
Seascape	Tunnel Field	Pink bar spanning late July, August, and September.		
		Red bar spanning August and early September.		
Albion	Tunnel Field	Yellow bar spanning late July, August, and September.		
		Orange bar spanning August and September.		

# Strawberry Production Over 2 Years



Average 2-year yield

- Tunnel 3.2lb/plant
- Field 2.3lb/plant

Based on 14x90ft area

- Tunnel ~210 flats
- Field ~140 flats

Based on \$4/pint

- Tunnel \$10,080
- Field \$6,720

# Grower Experience

- Cultivar yield rankings were the same as the main trial
- All grower cooperators thought it was worth growing in high tunnels, and several would add the use low tunnels in early spring
- Although Evie 2 yielded the highest, growers did not like that it had a softer berry that was difficult to transport to market
- Albion was the favorite cultivar of growers – the firm fruit and excellent flavor outweighed the low yield and late harvest
- Growers found it difficult to keep up with both strawberry and vegetable harvest, which peaked at a similar time
- Emphasized the importance of drip irrigation, ventilation and fertigation



# Cultivar Comparison

## Evie 2



- + **Highest yield**
- + Large, uniform fruit
- + Good performance in tunnel and field
- + Early maturity, long picking season
- + Good winter survival, better in tunnel
- ↓ Softer fruit, harder to transport
- ↓ Flavor not as impressive
- ↓ Lower preference of growers

## Mara des Bois



- + **Unique flavor, very aromatic**
- + High yield
- + Early maturity, long picking season
- + Very good winter survival
- ↓ Small fruit size
- ↓ Lighter red color, softer fruit
- ↓ High cull rate due to misshapen fruit
- ↓ Difficult to pick

# Cultivar Comparison

## Albion



- + **Excellent flavor**
- + Very firm fruit, easy to transport
- + Large fruit size, uniform fruit
- + Preferred variety of grower participants
- ↓ Later maturity, shorter picking season
- ↓ Lowest yield
- ↓ Lower winter survival

## Seascape



- + **Firm fruit**
- + Good flavor
- + Med-large fruit size
- + Consistent harvest across season
- + Very good winter survival
- ↓ Somewhat variable fruit shape

# Overall Recommendations

- High tunnel production seems to be worthwhile in Central Oregon, and the season can be complimented by field production
- Careful high tunnel management is needed to maintain temperatures in the optimal window for strawberry production
  - Includes the use of low tunnels in the early spring and shade cloth in summer
- All berry cultivars were well-received by customers, and cultivar choice depends on growers' criteria
  - Consider yield, firmness, early vs late maturity, etc
- Evie 2, Mara des Bois and Seascape all produced > 2lb/plant in 2<sup>nd</sup> yr

# Acknowledgements

- Cooperating farmers in Central Oregon
- Kara Young for technical assistance
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# Questions?



**Thank you for your attention!**

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