



CLR on commercial coffee farms in Hawaii: first year insights

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CLR Monitoring on Hawaii Island

- Agronomic characteristics
- Incidence (leaves with CLR present)
- Severity (leaf area covered by CLR)
- Defoliation
- Management practices
- Costs to apply fungicides



CLR Timeline

Kona:

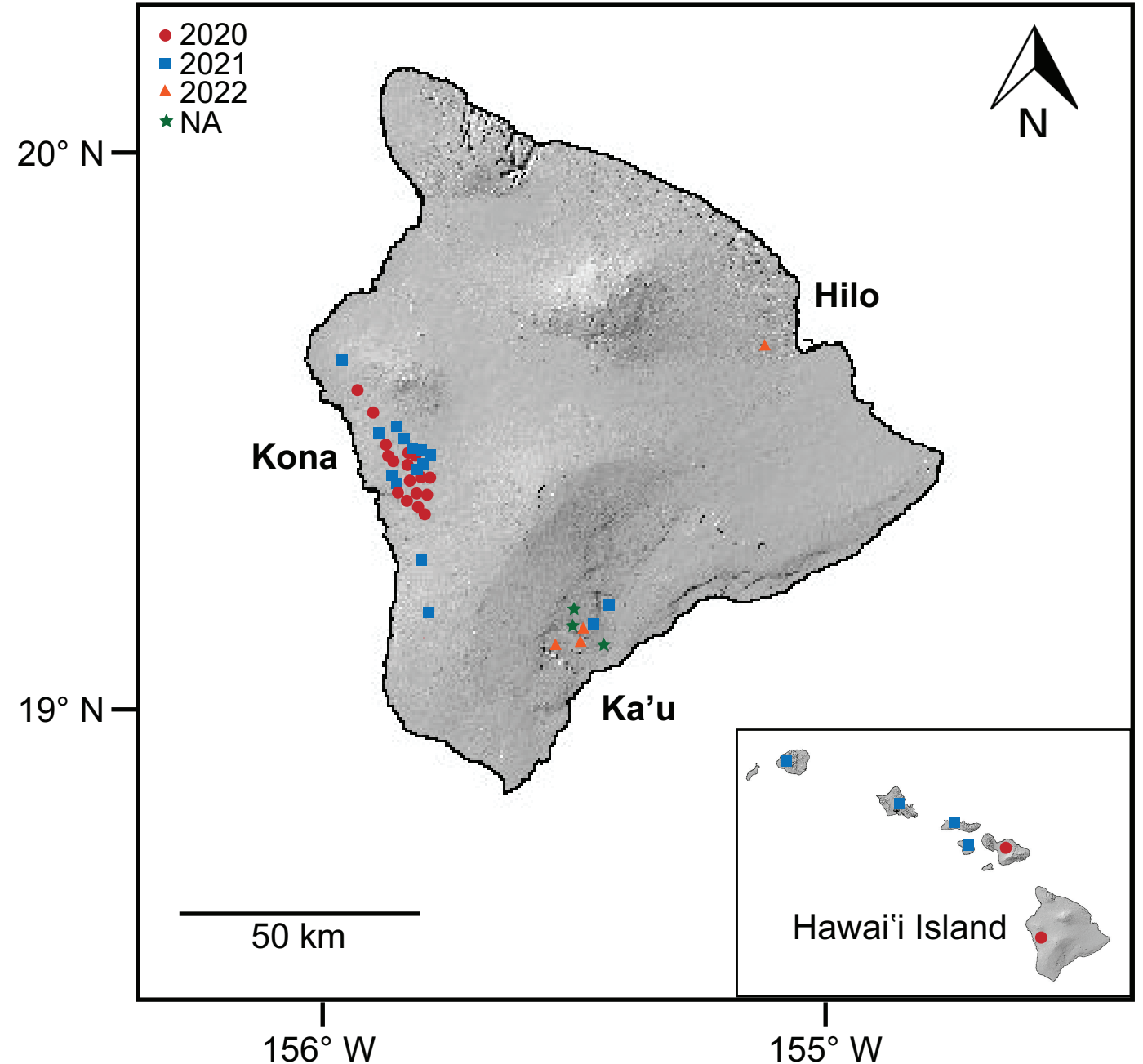
- Nov 2020: first detection
- Jan 2021: 64% positive
- Jun 2021: 87% positive
- Nov 2021: 100% positive

Ka'u:

- Sep 2021: first detection
- Dec 2021: 70% positive
- Mar 2022: 90% positive

Hilo:

- Feb 2022: first detection

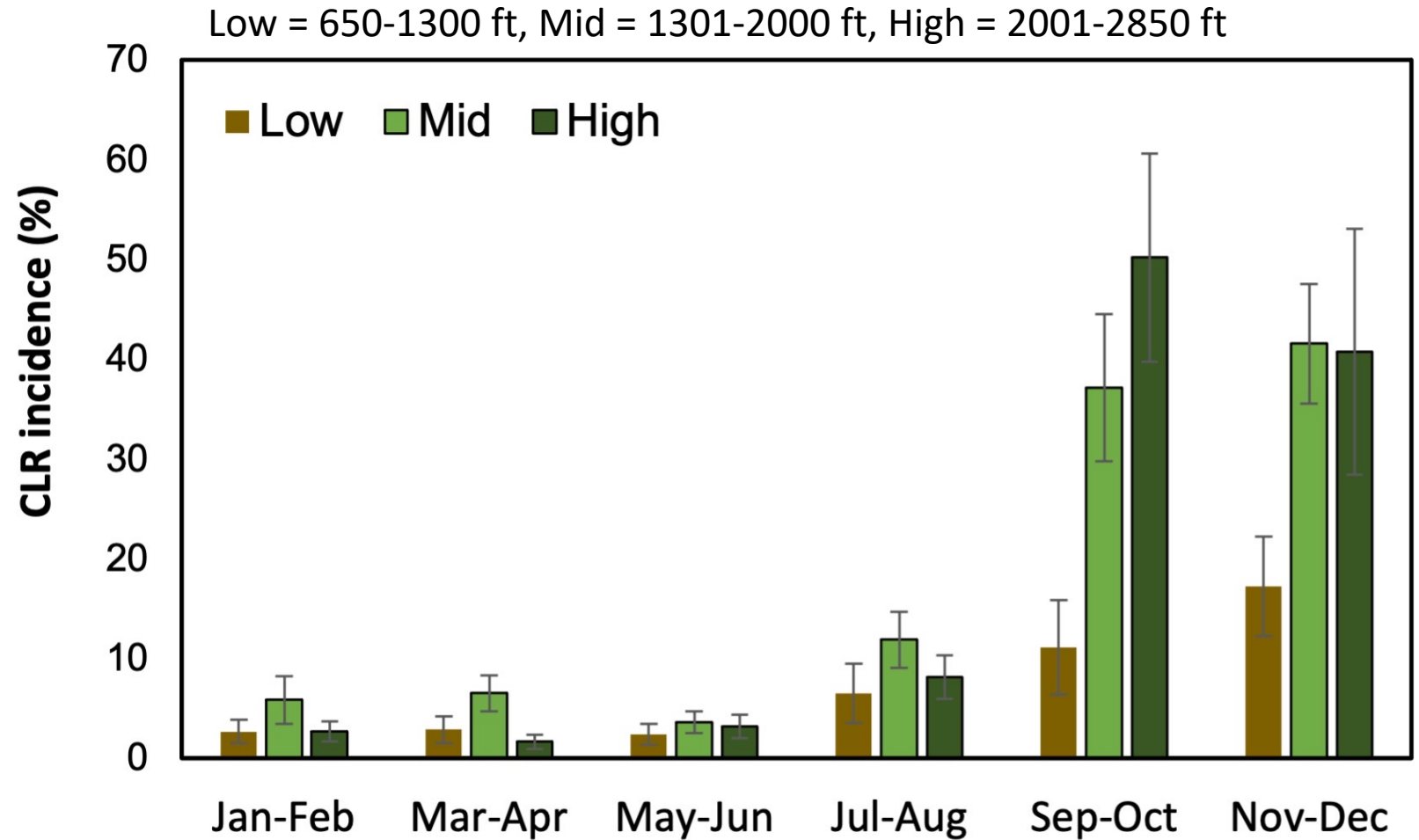


Agronomic Characteristics: Kona

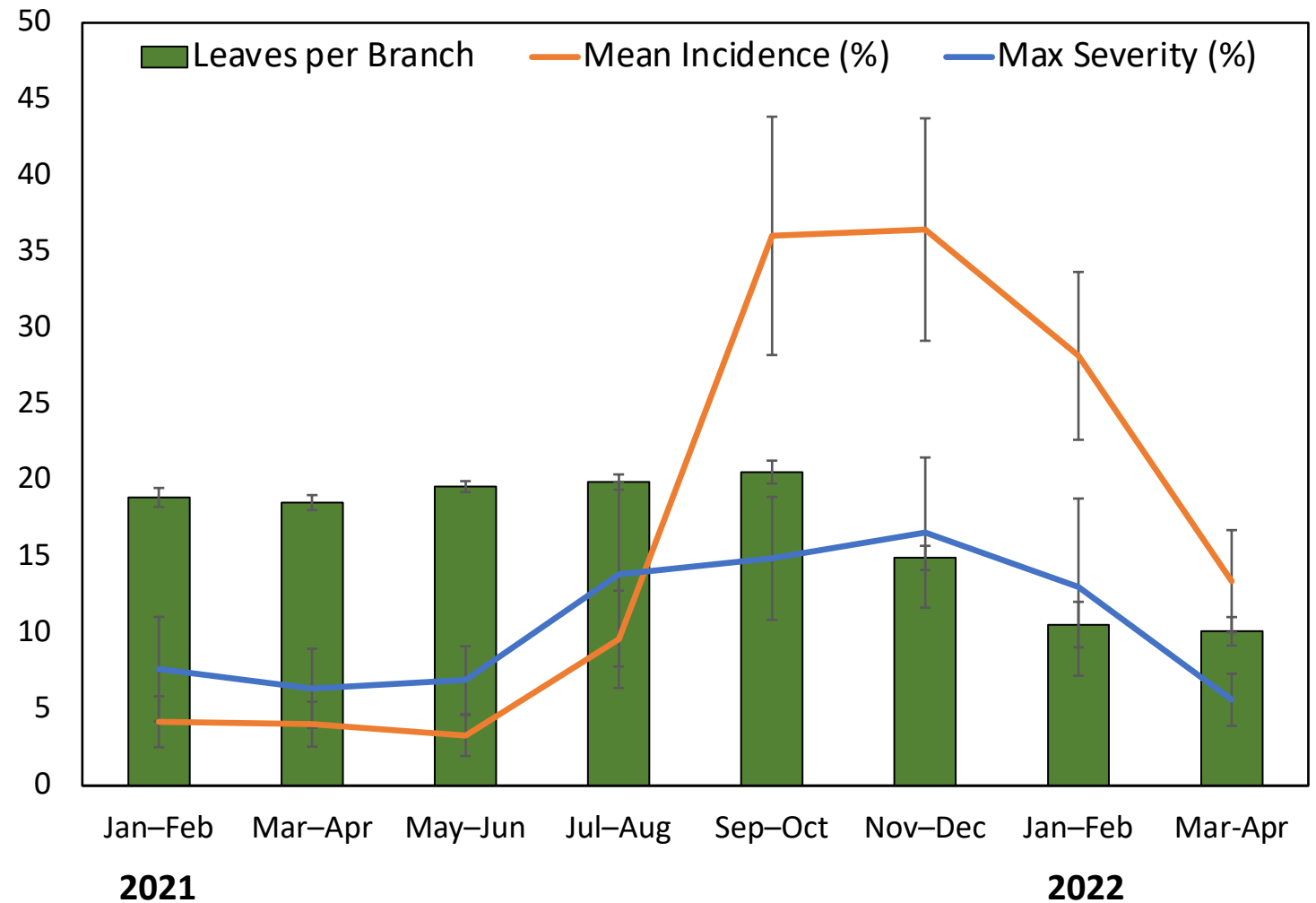
- Elevation range: 204-875 m
 - 6 low, 14 mid, and 10 high-elevation farms
- Varieties planted: typica (87%) and caturra (13%)
 - Both highly susceptible to CLR
- Planting density: 450-1500 trees/acre (average = 820)
 - 725 trees/acre is optimal for typica
- Age of trees: 3-100+ years old (average = 26)
 - Increased susceptibility to infection >20 years old
- Sun = 70%, Partial shade = 30%
- Conventional management = 77%, Organic = 23%



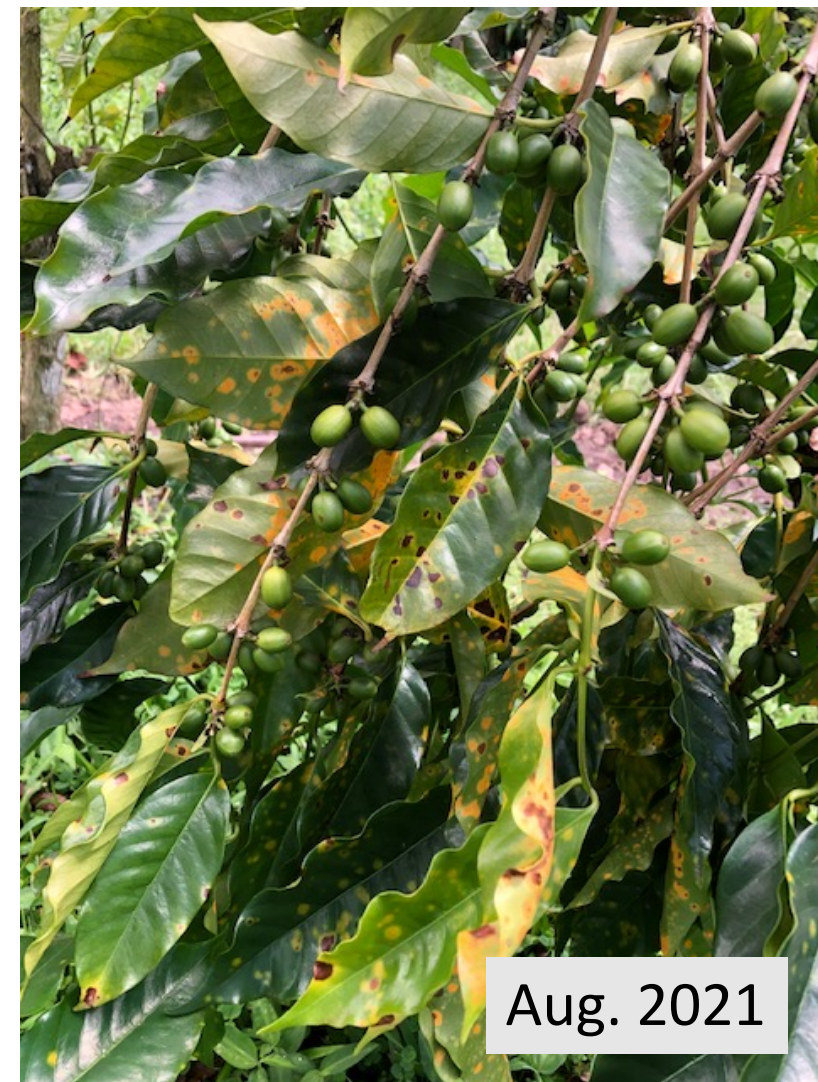
CLR Incidence across elevations: Kona



Incidence, severity, and defoliation: Kona



Progression of disease in the field





Sep. 2021



Oct. 2021



Sep. 2021

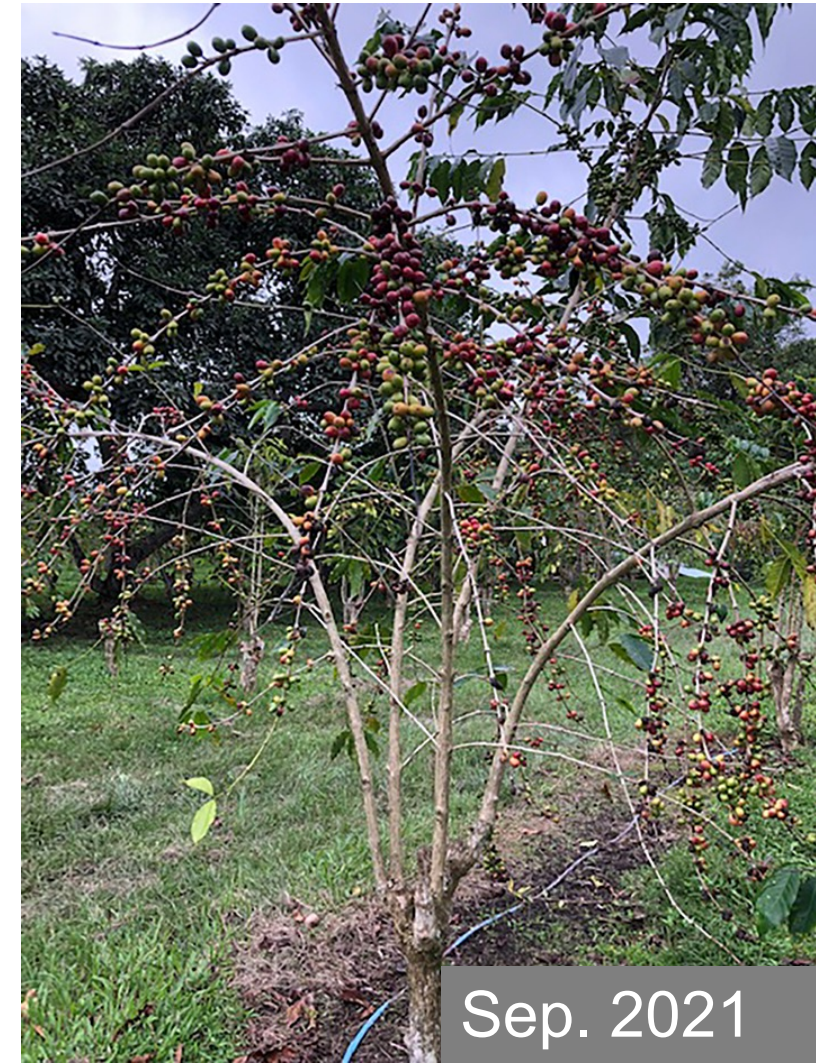


Oct. 2021

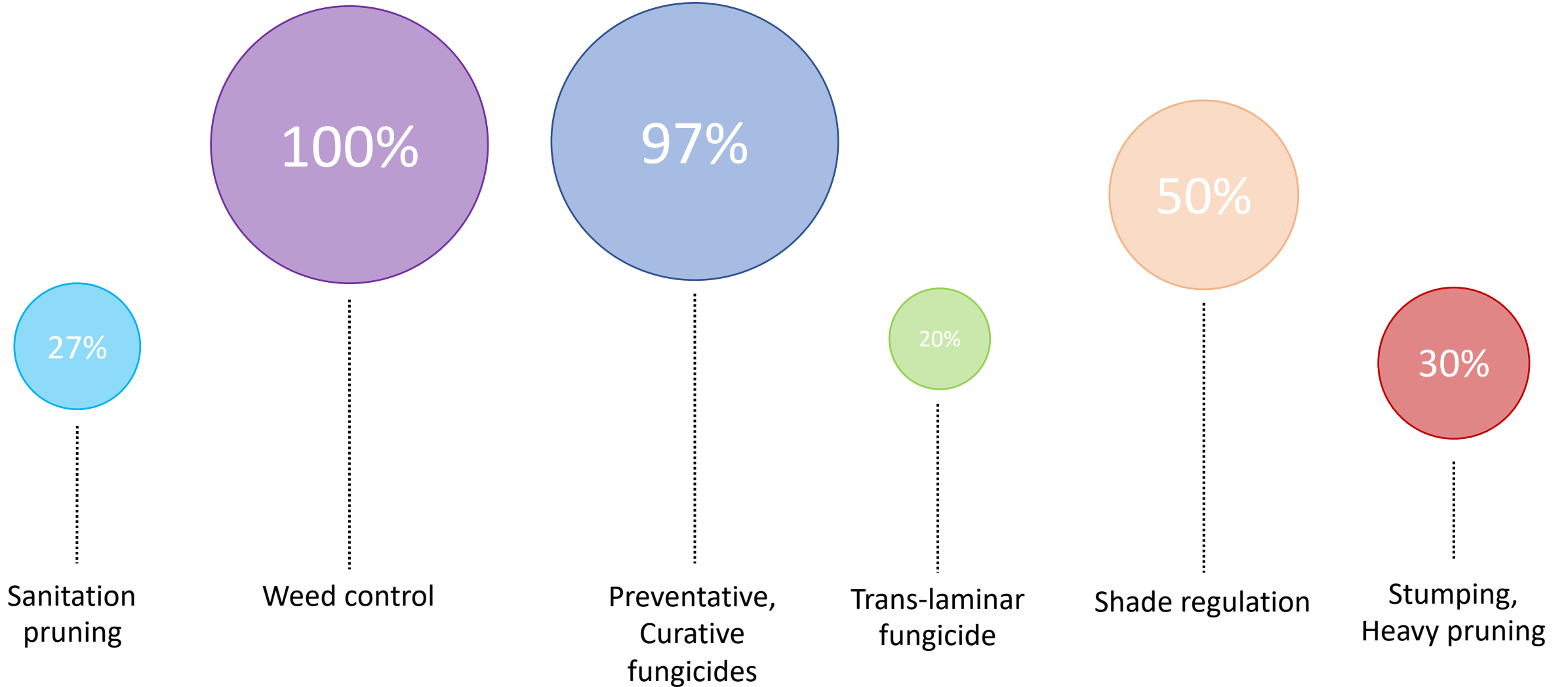


Nov. 2021

Pre and Post CLR: Holualoa, Kona



CLR Management



Cost of fungicides

Coffee Lot	Spray Method	Fungicide Sprays	Fungicide Cost/acre (USD)	Labor Cost/acre (USD)	Monitoring Cost/acre (USD)	Total Cost/acre (USD)	Yield/acre (lbs)	Profit/acre (USD)	CLR Cost/acre (%)
1	Backpack	10	417	495	150	1062	4183	10,039	10.58
2	Backpack	10	472	520	175	1167	5033	12,079	9.66
3	Tractor	7	255	315	150	720	10,000	24,000	3.00
4	Backpack	6	220	480	150	850	3888	9331	9.11
5	Backpack	3	90	210	150	450	4500	10,800	4.17
6	Tractor	6	142	270	150	562	11,312	27,149	2.07
7	Tractor	6	155	240	150	545	8257	19,817	2.75

Total cost to spray fungicides = \$450-1167 per acre

- Tractor cost per spray = \$91-103
- Backpack cost per spray = \$106-150

Percent of profits spent to cover cost:

- Tractor = 2-3%
- Backpack = 4-11%



Current Research

- Predictive modeling to forecast CLR outbreaks
 - Inputs: weather, management, plant phenology, CLR incidence
 - Output: predicts risk of CLR increase the following month
- Characterization of CLR spore viability in the field
 - Sun vs. shade
 - Low vs. mid-canopy
- CLR dispersal via wind
 - Various designs of passive/active spore samplers
 - Molecular ID, spore quantification
- Natural predators of CLR
 - Molecular & morphological ID
 - Presence, abundance, correlation with severity



MAHALO!

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- Please feel free to contact me with any questions:
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