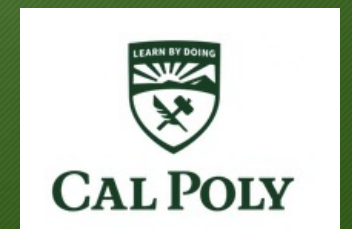


California Clean Biomass Collaborative

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Mission Statement

The Clean Biomass Collaborative exists to identify technically and economically feasible and sustainable strategies to achieve a near-complete phase-out of agricultural burning in the San Joaquin Valley.

The Collaborative provides a forum for key stakeholder groups to identify and overcome issues inhibiting deployment of advanced bioenergy projects, and to communicate resulting options and benefits.

We believe representation across all stakeholder areas is vital to ensure transparent evaluation of all alternatives



Guiding Principles

- 1) Is results-oriented,
- 2) Values fair representation among stakeholder groups,
- 3) Operates transparently,
- 4) Practices civil behavior,
- 5) Is focused on the nexus of science, policy, social justice, economics, community, and the environment while being mindful of the need for compromise and intersectionality.

Core Members

The Collaborative is composed of core members representing five key stakeholder areas in the San Joaquin Valley:

- Agricultural production
- Biomass industry
- Government
- Environmental justice organizations
- Research and academia

Background

Nearly all agricultural burning in the San Joaquin Valley will be phased out by January 1, 2025

In preparation for this and in accordance with recommendations by the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and California Air Resources Board (CARB), the California Clean Biomass Collaborative is tasked with identifying and evaluating alternatives to agricultural burning.

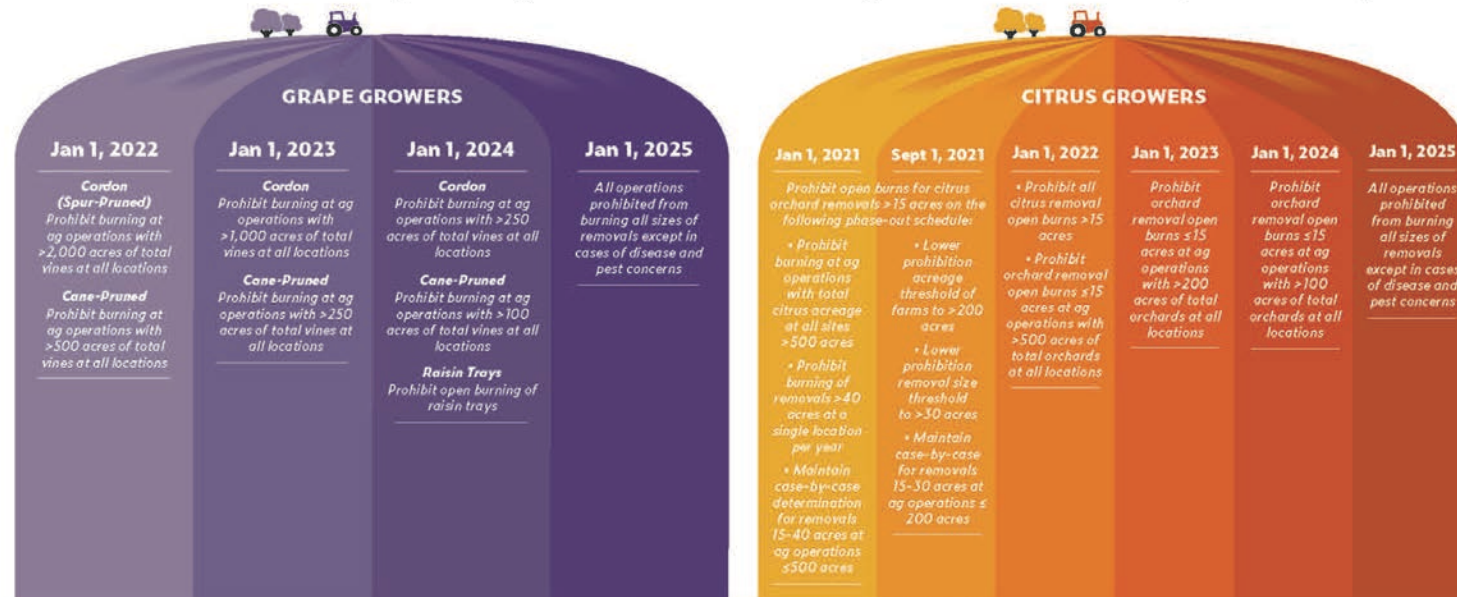
Background

(From SJVAPCD June 3, 2021 presentation: Supplemental Report and Recommendations on Agricultural Burning)

- Valley has toughest restrictions on agricultural burning in state (SB 705 only applies to San Joaquin Valley)
- District operates comprehensive Smoke Management System
 - Tightly regulated and enforced
 - Only authorized when projects will not impact air quality standards, smoke-sensitive areas, cause public nuisance
- Since 2005, District has prohibited burning from a majority of field crops, prunings, orchard removals, weed abatement, and other materials
- Until 2014, restrictions reduced ag burning by 80%
- Due to changing state policies, Valley has lost significant biomass capacity (primary historical alternative to ag burning)
 - Over 20 plants in 1980s, down to 5 plants today
 - Loss of capacity has significantly impacted transition away from open burning

Prepare for the...

Phase Out of Open Agricultural Burning in the San Joaquin Valley



Incentive Funding is NOW AVAILABLE

CROP TYPE	Chipping <u>with</u> soil incorporation	Chipping <u>without</u> soil incorporation on-site	Chipping with off-site beneficial reuse
Orchards	Up to \$600/acre	Up to \$300/acre	Up to \$600/acre
Cane-pruned vineyard	Up to \$800/acre	Up to \$500/acre	Up to \$800/acre
Cordon-pruned vineyard	Up to \$1,300/acre	Up to \$1,000/acre	Up to \$1,300/acre
ADDITIONAL \$100 PER ACRE FOR SMALL AG OPERATIONS LESS THAN 100 ACRES			
Chipping Equipment	Funding available on a limited basis for existing chipping contractors and agricultural operations interested in expanding their fleets		

Please note this is a summary of new phase-out requirements. Please visit our website for full details on existing requirements and information regarding the District's smoke management system.

Prepare for the...

Phase Out of Open Agricultural Burning in the San Joaquin Valley



**Due to disease issues, apple, pear, and quince crops are currently exempt from these requirements*

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Background

- There are many value added alternatives to agricultural burning
- The issue of adoption revolves around a few key areas:
 - Biomass removal (especially in the case of vineyards with metal trellis systems)
 - Removal equipment inventory (currently large State investments)
 - Restrictive statutes/regulatory barriers
 - A coordinated supply chain
 - Financial support (the assumption of risk in a startup)

Biomass Supply Chain Focus Areas

Biomass Inputs

- Vineyards
- Nut Orchards & shells/hulls
- Citrus Orchards
- Etc.

Technologies

- Pyrolysis
- Gasification
- Whole Orchard Recycling
- Composting
- Etc.

Outputs

- Energy
- Fuels
- Biochar
- Compost
- Etc.

Capital

- Private equity
- Federal/State funding
- Etc.

CCBC Expectations - Biomass Inputs

Key concern is the removal of metal wire and stakes from vineyards when they are removed

Longer term, a range of environmentally friendly disposal methods that are embedded into the standard business practices of the agricultural community.

Discuss real, practical, and ready solutions to the accumulation of Ag biomass

Broad focus on sources of woody biomass such as almond shell piles, that also need additional options for usage domestically

In the near-term (next 3 years), enable the establishment of several commercial scale sustainable biomass disposal methods that require the least government support while meeting our clean air goals.

CCBC Expectations - Technologies

Collaborative not close the door on any solutions

Current biomass facilities incorporate advanced technologies that continue to use wood but through a gasification process, creating hydrogen and involving carbon capture and storage

Provide increased education about options that currently exist, new bioenergy solutions that are currently in development, and work together to overcome any existing challenges to ensure that these options will be successful alternatives going forward.

Highlight processes that can be utilized in the marketplace and are affordable for industries in need of addressing large quantities of agricultural biomass

Consider solutions to ag biomass utilization that can compliment forest health and restoration and wildfire risk reduction projects

CCBC Expectations - Conversion output

Wood vinegar which is a bio-herbicide and bio-pesticide

Biomass conversion with carbon capture potential to deliver diverse economic and environmental co-benefits

Examine different community perspectives on emerging solutions and where additional research may be needed.

Biochar use - no agronomic use rate requirements for different crops in California

Environmental concerns go beyond eliminating GHG's produced by burning, but also reducing and eventually eliminating the significant dust created during harvest.

Collaborative should consider solutions that have other benefits or ripple effects which might mitigate air quality issues, or even mitigate climate change through atmospheric and soil carbon sequestration

CCBC Expectations - Overall

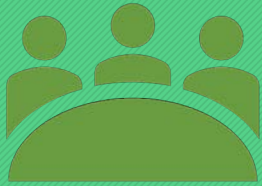
Collaborative charts the path toward a biocarbon economy with clear priority on stimulating markets & policies to that end. Environmental, Social, and Governance (ESG) is a massive movement within publicly traded companies, and we should intend to see much of that capital and goodwill flow into California.

Develop a list of short-term biomass options that can be utilized in California and potentially incentivized by the State of California. These solutions must meet the effectiveness and practicality test but also the environmental standards of the State.

Collaborative to have a shared mission of identifying opportunities for addressing agricultural biomass in the San Joaquin Valley that will have the lowest environmental costs but highest socioeconomic benefits.

Converge on a set of solutions that provides stakeholders with sustainable and environmentally sound options for use and/or disposal of agricultural wastes, and that these solutions are economical and simple to implement and deploy widely.

CCBC Schedule



Planning for regular (bimonthly) meetings over 2022 to discuss each focus area



Spring Symposium



Technology demonstrations and site visits

CCBC Output

- White paper outlining a path forward for agricultural biomass
 - Focus on initial needs and a sustainable future

Thank you, Questions?

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