Cover Crops for Orchards

2026 Apple Orchards Webinar

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Agriculture & Natural Resources

Cover Crops in Orchards

- Resources
- Concept & Principles
- Benefits & Concerns
- Types of Cover Crops
- Overview of practices
- Managing concerns

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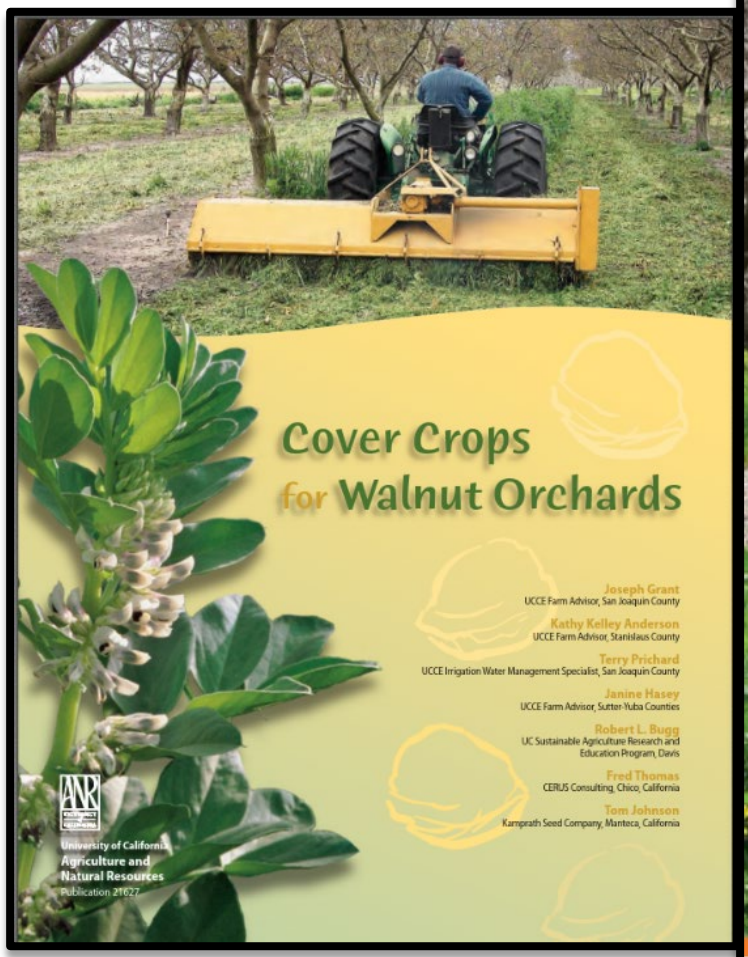

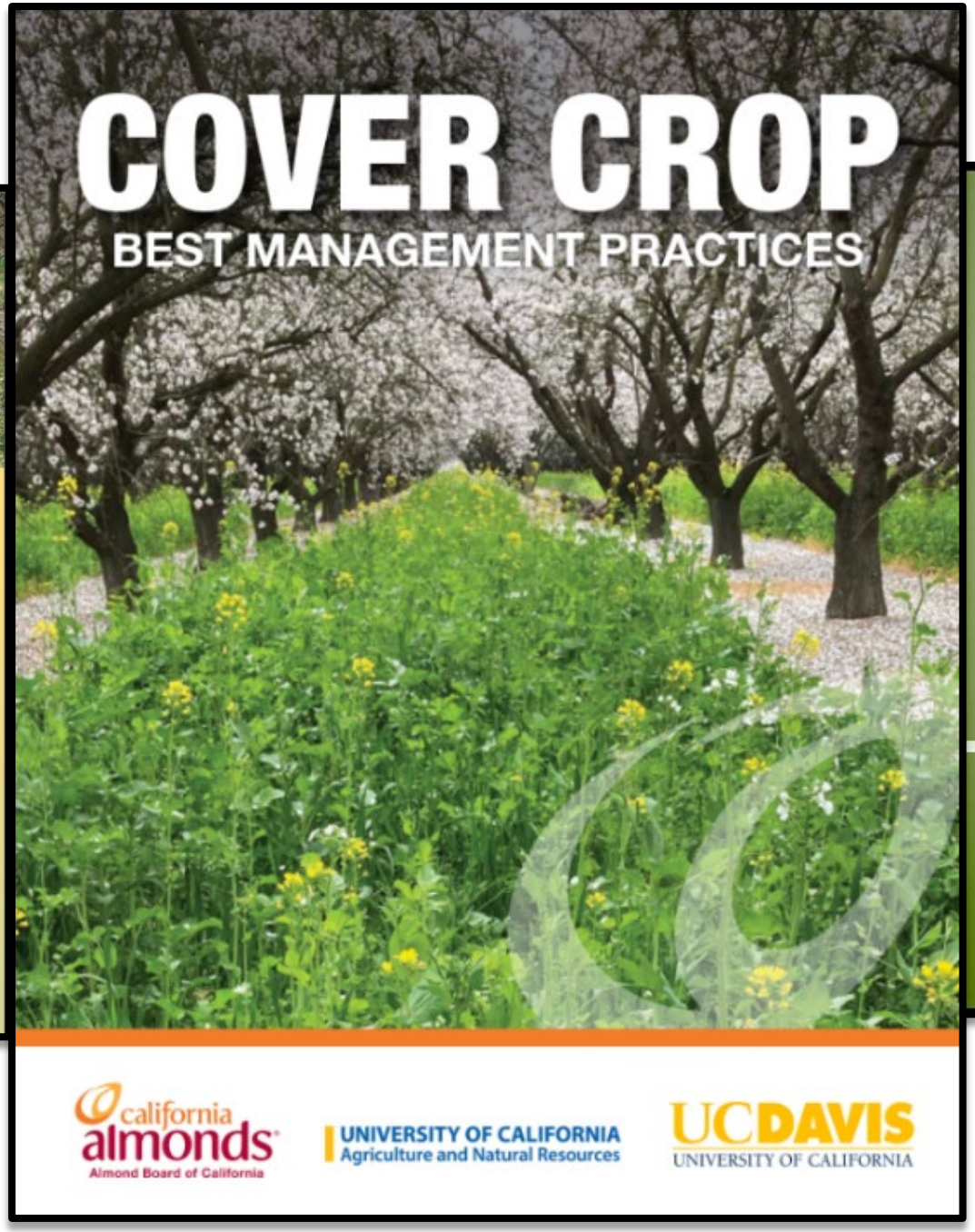

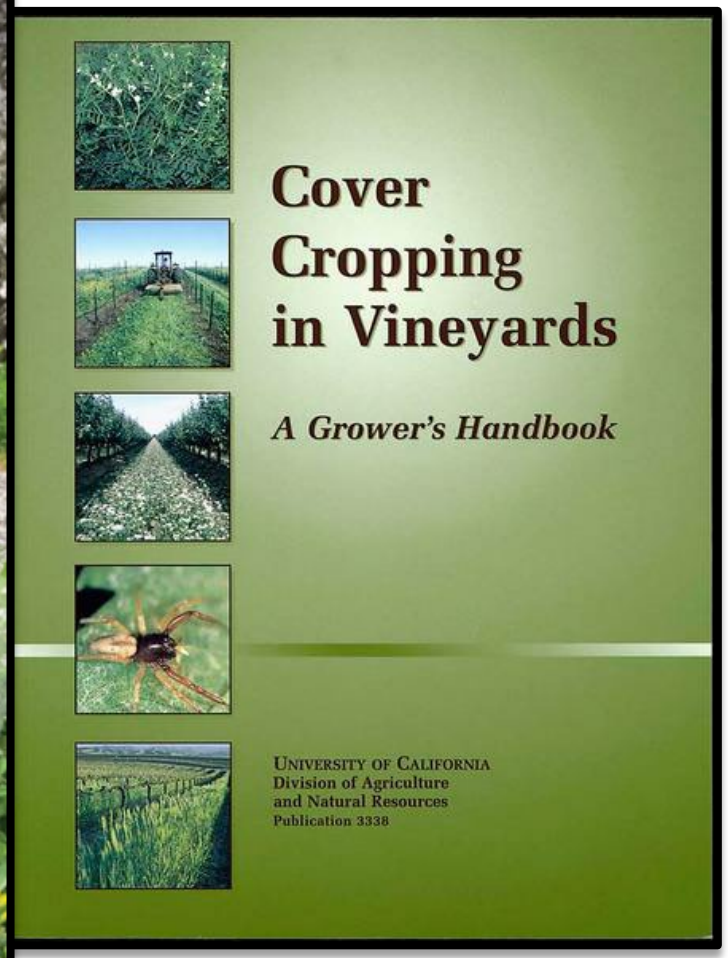

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https://ucanr.edu/site/california-cover-crops-resources

Growers profiles

UC ANR / California Cover Crops Resources

California Cover Crops Resources

Home

How to Manage Cover Crops

Cover Crops for California Farms

A cover crop can be any non-cash crop grown in addition to the primary cash crop. Cover crops offer many potential benefits. There are also management implications to consider when deciding whether to use cover crops, and identifying which crop or mixture of

Learn more about incorporating cover crops into your farming operations using the resources on this website.

How to Manage Cover Crops

Cover Crop Selection

Resources

UC SAREP

Sustainable Agriculture Research and Education Program

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VIDEOS: featuring renowned growers & experts

Cover Cropping Opportunities in Specialty Crops

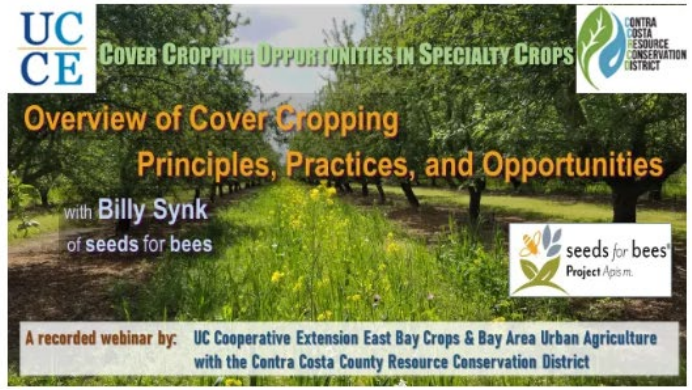
Print

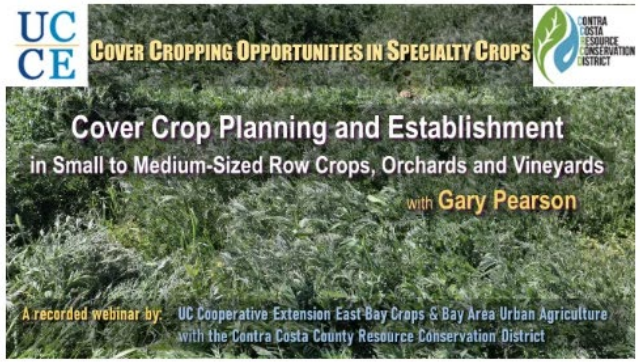
presented by *Contra Costa County Resource Conservation District* and *UC Cooperative Extension*

Cover cropping is a key practice for soil health that has historically played an important role in agriculture, but successful use of this soil conservation practice can be complex and may seem impractical or of limited benefit in many of today's farming operations.

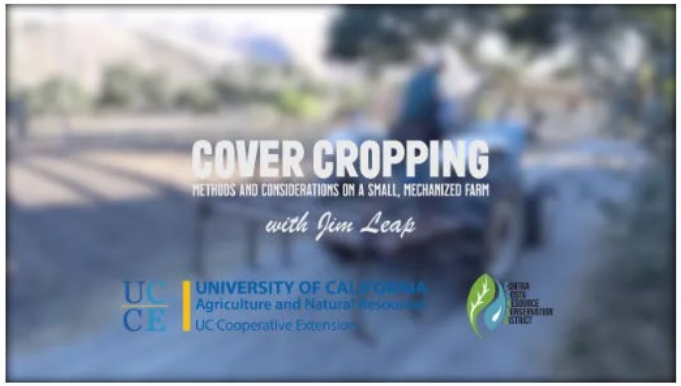
WEBINARS

link.ucanr.edu/CoverCropOps





VIRTUAL SITE VISITS



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CAFF COMMUNITY ALLIANCE with FAMILY FARMERS

THE FRESHWATER TRUST

Cover Crop Decision Guide for Perennial Cropping Systems

caff.org

https://caff.org/cover-crop-decision-guides/

CAFF COMMUNITY ALLIANCE with FAMILY FARMERS

THE FRESHWATER TRUST

Cover Crop Decision Guide for Annual Cropping Systems

Cover Cropping in California's Water Scarce Environments

Practical considerations for managing cool-season cover crops with maximal water benefits and minimal water use

Key Contents

Sustainable Conservation

CAFF COMMUNITY ALLIANCE with FAMILY FARMERS

USDA

UNIVERSITY OF CALIFORNIA Agriculture and Natural Resources

WESTERN COVER CROPS COUNCIL

ABOUT RESOURCES DECISION TOOLS GET INVOLVED

COVER CROP RESOURCES

Annual Cropping Systems

Perennial Cropping Systems

Soil Health

Nutrient Management

https://westerncovercrops.org

What are cover crops?

- **Annual field crops** (mostly)
- **Planted in orchard middles**
- **Protect & improve soil**
- **Can have multiple benefits**
- **Biomass > resident vegetation**
- **Benefits accrue over years**

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Why cover crop?

1. **Cultivate healthy, well-functioning soil over time.**

2. **Address specific management concern or goal**

   Examples:
   - water infiltration
   - nitrogen management,
   - pollinator forage

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Cover crop season

- Winter cover crop
- Summer cover crop
- Perennial/reseeding

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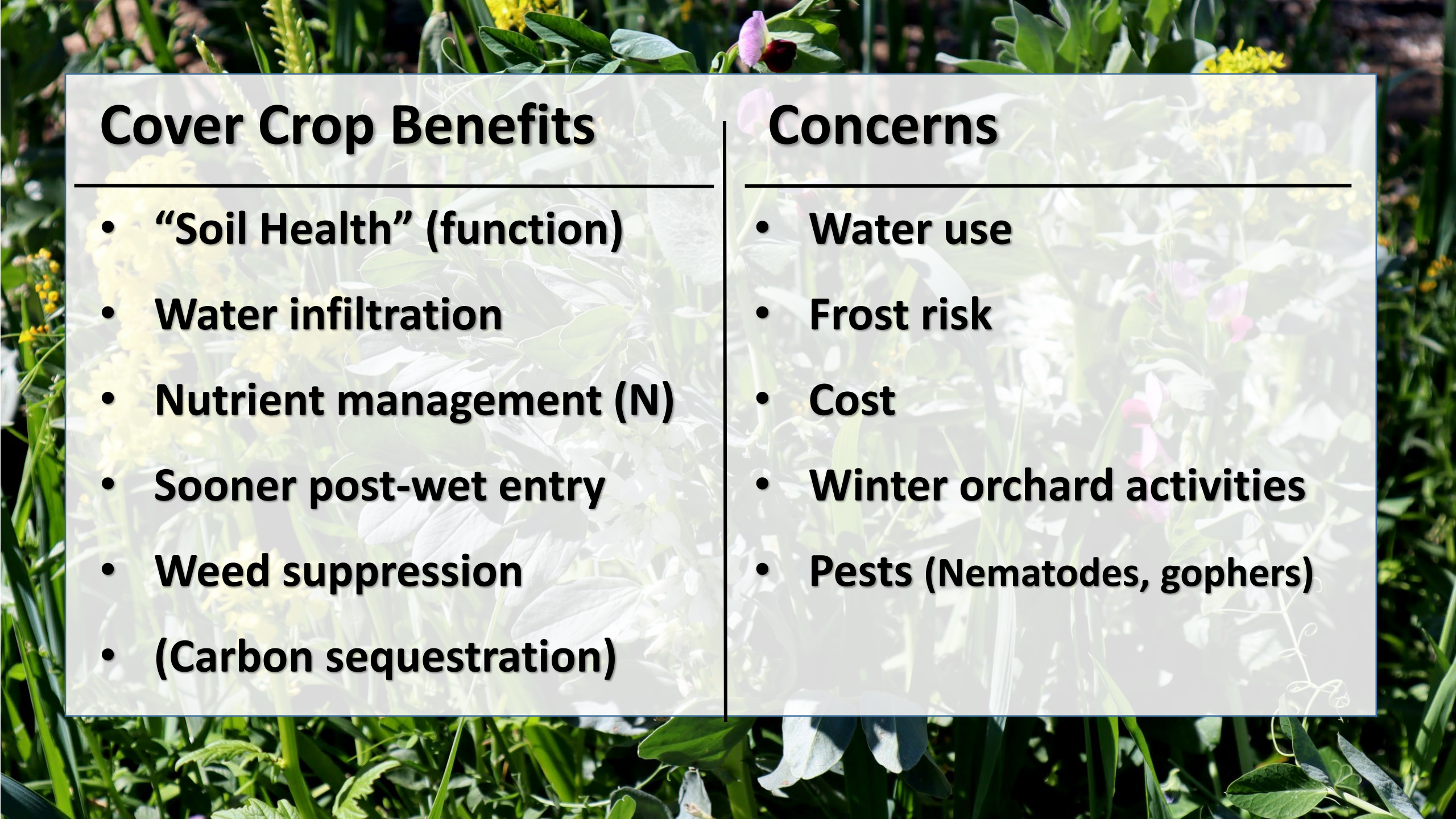
Cover crop season

- **Winter cover crop**
  - Rainy season
  - Trees dormant
  - Terminate in Spring
- Perennial/reseeding
- Summer cover crop

Cover crop season

- **Winter cover crop**
  - Rainy season
  - Trees dormant
  - Terminate in Spring
- **Perennial/reseeding**
- **Summer cover crop**
  - Grasses & clovers
  - Relatively less biomass



Cover Crop Benefits

- "Soil Health" (function)
- Water infiltration
- Nutrient management (N)
- Sooner post-wet entry
- Weed suppression
- (Carbon sequestration)

Concerns

- Water use
- Frost risk
- Cost
- Winter orchard activities
- Pests (Nematodes, gophers)

Soil Health

- Increase Organic Matter
- Physical function — structure, water infiltration & retention, erosion protection
- Biological function — nutrient cycling, aeration, disease suppression

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Water infiltration

- **Roots open channels**
- Organic Matter improves soil aggregation (pore structure)
- OM increases soil water holding capacity
- Cover/OM prevent crusting

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Nutrient management

- Legumes contribute Nitrogen
- Cover crops forage & cycle N
  (esp. grasses)
- OM improves nutrient cycling & holding capacity

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Early post-wet access

- Cover crops take up water
- Provide tractive surface
- Good for early spring activities like planting
- Depending on type and growth stage, may not survive trampling

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Weed Suppression

- **Depends on stand quality & timing**
- **Non-planted area will require weed control**
- Can function as a mulch if not incorporated

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Carbon Sequestration

- State priority
- Incentive programs
  - ✓ California Healthy Soils
  - ✓ USDA EQIP

    (Environmental Quality Incentives Program)

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Pollinator support

- **Incentive programs**

  ✓ **Seeds for bees**
  (ProjectApism.org)

Cover Crop Types

- **Grasses** — grain rye, oat, triticale; ryegrasses, fescues
- **Legumes** — clovers, vetch, peas, bell beans (favas)
- **Mustards (Brassica)**

  — mustards, radishes

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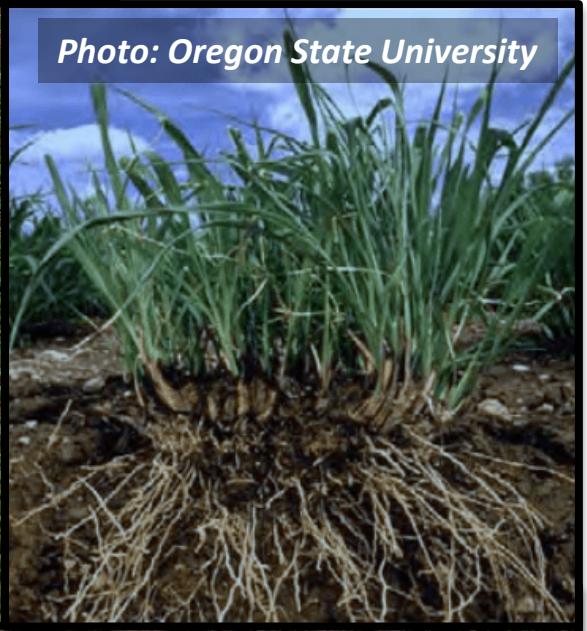
Grass Cover Crops

- Fast germinating
- Good at foraging N
- Abundant, fibrous roots
- Lots of C-rich biomass
- Slow to decompose
- Triticale cultivars with high root & low veg biomass



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Legume Cover Crops

- Nitrogen-fixing

  (bacterial symbiosis in nodules)
- Decompose quickly
- Generally large-seeded
- Clovers perennial or reseeding, low-growing
- Flowers for pollinators

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Mustard Cover Crops

- Fast-growing
- Flowers for pollinators
- Large taproots
- Large biomass if left late
- May suppress nematodes
  (esp. through “biofumigation”)

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Cover Crop Mixes

- “Hedging bets” for a good stand
- Combining benefits
- Balancing C & N for decomp
- Pre-made mixes available

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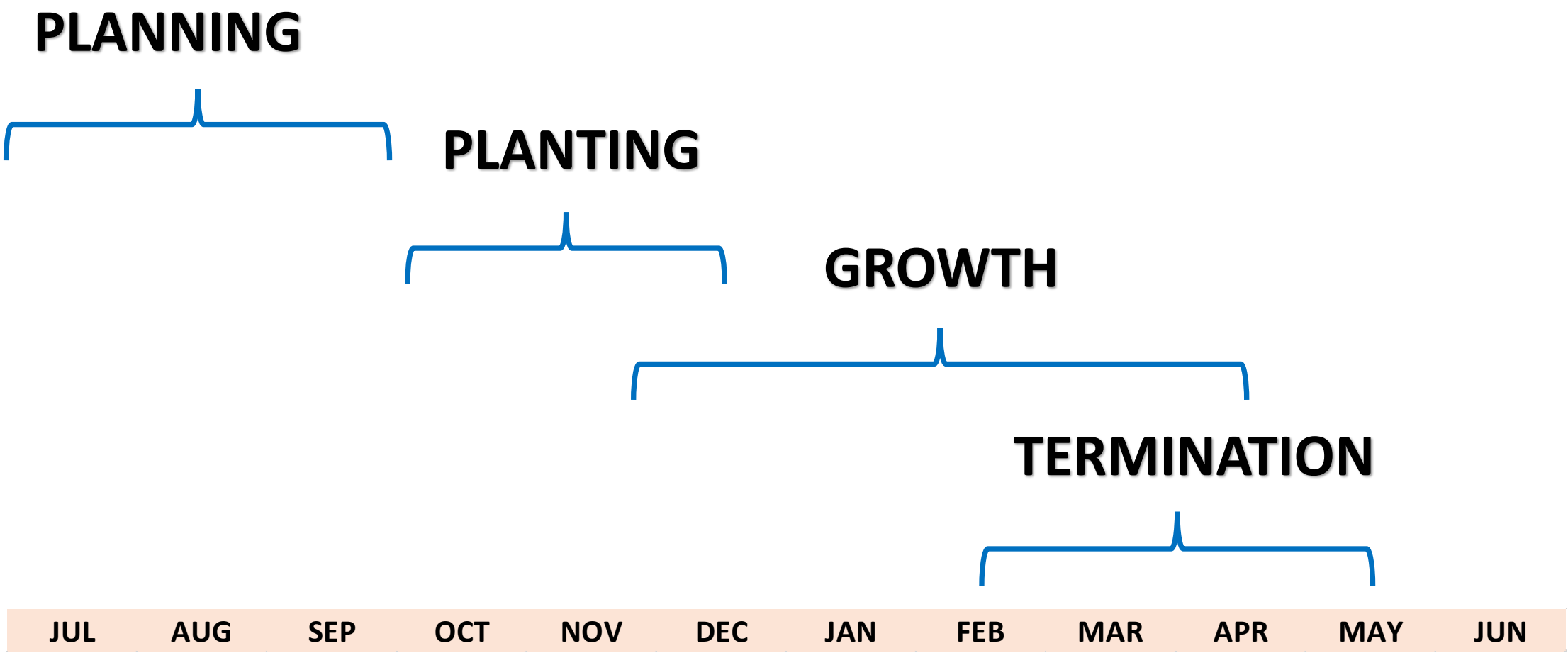
Cover Crop Process



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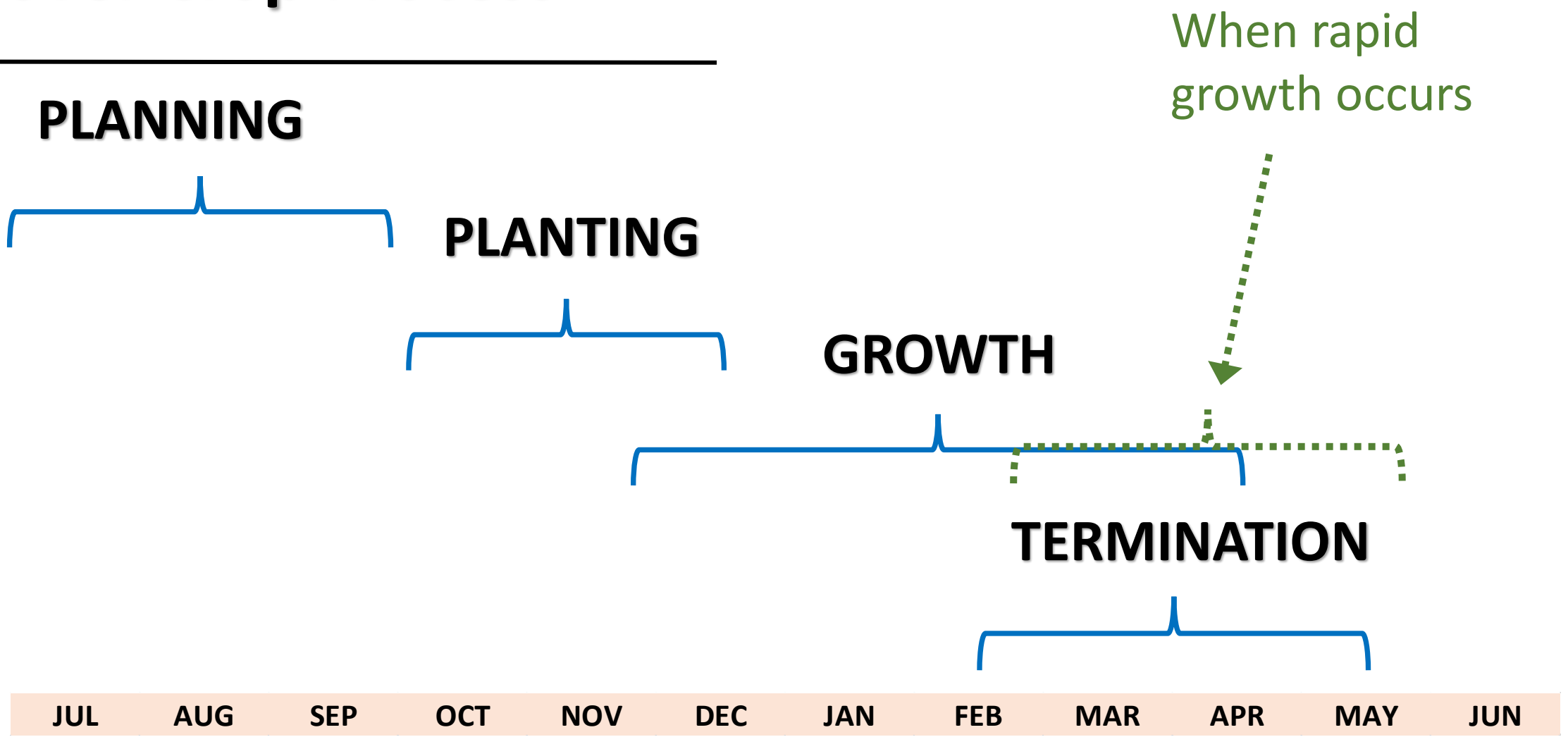

Planning the Cover Crop

- Assess needs, strategy
- Calculate planting area
  (middles only, width based on equipment & passes)
- Select & order seeds
- Determine seeding & termination equipment

Planting the Cover Crop

- Light ground preparation

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Planting the Cover Crop

- Light ground preparation
- Grain Drill, No-till drill, or spreader (can rent or hire)

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- Calibrate planting equipment

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Planting the Cover Crop

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- Calibrate planting equipment
- Drag and/or roll for good seed-soil contact
- Plant ahead of rain or irrigate

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Planting the Cover Crop

- Tree row pre-emergent spray before or after seeding
- Seed in the fall

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Planting the Cover Crop

- Tree row pre-emergent spray before or after seeding
- Seed in the fall
- Germination before leaf drop
- Sprinkler irrigation helpful if rains are late

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Winter growth

- **Monitor for gophers, pests**
- **High mow weeds** (if needed)
- **Prune, orchard sanitation** (possibly in unplanted rows)

Winter growth

- **Monitor for gophers, pests**
- **High mow weeds** (if needed)
- **Prune, orchard sanitation** (possibly in unplanted rows)
- **Enjoy watching it grow**

Termination

- Time is of the essence
  - Max biomass
  - Conserve moisture
  - Maintain pollinator & beneficials habitat
  - Manage residue

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- Roller crimper (advanced)

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- Mow and/or disk
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Termination by grazing?

Key considerations

- Soil type
- Water availability
- Late Fall and Winter activities
- Pollinator support & competition
- Frost risk
- Nematodes
- Gophers & other rodents
- Costs (vs benefits & incentives)

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Concerns

- **Water use:**
  - **Timely termination**
  - **Monitor moisture**

Concerns

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  - growth ⇔ rain

Concerns

- Water use:
  - Timely termination
  - Monitor moisture
  - growth ⇔ rain
- Frost risk:
  - Late bud break helps
  - low-growing crop (grass)
  - mowing/timely termination

Concerns

- **Winter orchard tasks:**
  - **plant alternate rows**
  - **low-growing crop (grass)**

Concerns

- **Rodent pests:**
  - **Control gophers/voles prior to cover crop**
  - **Monitor rodent activity**
- **Nematodes:**
  - **Select cover crops that are not hosts** (certain legume cvs)

Concerns

- Cost:
  - Seed, equipment, fuel/labor
  - start small, experiment
  - take advantage of incentive program
    - Healthy Soils Program
    - EQIP
    - Seeds for bees

Brassica ≈ $13/acr

Multi-mix ≈ $33/acr

Triticale ≈ $13/acr


Resident cover
Late March

Mt. Diablo Region Crops

link.ucanr.edu/DiabloCropsBlog

Final thoughts

- Research
- Start small
- Experiment
- Compare notes
- Have fun

YouTube

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Funding for trial from
California Walnut Board