



PAm Mustard Mix

The blend of canola, mustards and daikon radish in the PAm Mustard Mix make it a good choice if you want to increase organic matter, water infiltration and honey bee colony health. Depending on your planting date and weather conditions, PAm Mustard Mix will start blooming in December/January and trigger colonies to initiate their annual population increase sooner. Some growers have also used this mix to help control soil nematode pests. This mix should be terminated before reaching maturity, to prevent reseeding in orchards.



PAm Clover Mix

The PAm Clover Mix is designed to help decrease erosion and increase nitrogen content in the soil. This mix will begin blooming in February/March. A successful stand of this legume mix can fix about 80 lbs. of nitrogen per acre. The delicate nature of clovers make it a good choice to encourage reseeding. Annual reseeding clovers will not become a weed issue like perennial clovers can.



Wolypod Vetch

Vetch is a legume that blooms later than all the other Seeds for Bees options. Its fine root hairs are excellent at stabilizing the soil surface and preventing erosion. A successful stand can fix more than 100 lbs. of nitrogen per acre. The "vine like" growing habit of this species allows it to work well if blended with small grains like triticale, rye or oats. When broadcasting vetch in young orchards make sure that berms aren't seeded as it can grow up tree trunks. This mix should be terminated before reaching maturity, to prevent reseeding in orchards.



PAm Wildflower Mix

A wildflower mix will add a pleasing aesthetic to any farm, orchard, backyard, or apiary. This diverse mix of flowers will ensure months of colorful blossoms that will please any nearby bees. This mix is well suited to hot and dry climates, and an excellent forage option for honey bees. In orchards, we recommend using the PAm Mustard Mix, PAm Clover Mix or Vetch if maximizing soil health benefits are a priority.

Seeds for Bees is a program of **Project Apis m.**
PAm is the largest honey bee health research nonprofit in the US; at the interface of beekeeping and agriculture.

The goal of Seeds for Bees is to encourage the adoption of cover crops as a useful management practice in California's orchards, farms and vineyards. PAm cover crop seed mixes benefit honey bee health and improve soil conditions.

With financial support from a diverse group of donors, we support beekeepers, growers, pest control advisors, crop managers, researchers and other key stakeholders in our nation's agricultural industries.

Please visit our website for more information.



Project Apis m.

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Learn more and Apply to Enroll at:
ProjectApism.org/Seeds-for-Bees

Project Apis m. is a 501.c.5 nonprofit organization

seeds for bees®



Project Apis m.

**Cover Cropping
to Improve
Pollination and
Soil Quality**

Weed Control

The PAm Mustard mix grows very fast and will out-compete weeds in orchards. The PAm Clover Mix has a slower rate of growth, and might benefit from an herbicide application prior to planting, of which any broadleaf, grass specific or broad spectrum herbicide will work. If weeds are a concern in a particular orchard block or location, using herbicide, burning or solarization before planting will only help the health of the stand.

Management

Ideally, cover crops should be terminated sometime in the spring. This will allow ample time for mowing or disking before harvest. If reseeding is desired, leaving plants intact until June may be necessary. This date will vary depending on planting date and local climate.

Irrigation

If precipitation falls at its historic rate and frequency, irrigation will not be required. If less than average rainfall occurs, early or late season irrigation can increase success.

Grower's Goal: Practice better land stewardship and help build strong, 8-frame + honey bee colonies by February to assist your pollination needs.

Prep, Planting, & Timing

Choosing the Proper Seed

Plant early blooming PAm Mustard mix to increase water infiltration and organic matter. Plant by October 5th to take advantage of the fall precipitation. Plant later blooming PAm Clover Mix or Vetch by November 15th to increase nitrogen and reduce erosion. All seed mixes are appropriate in mature orchards as well as newly established blocks.



Planting Methods

The best method for planting is direct seeding with drill equipment. If broadcast seeding is the only option, then a good, fine seed bed is desirable since most of the seeds are very small. Ideally, the soil should be disked, cultipacked with a ring roller, planted and rolled a second time. Seed should be no deeper than 1/4 inch.

Establishment Timing

In order to provide early winter bloom for honey bees, plant as early as possible and ideally before the first rain. All seeds, weeds, or cover crop will germinate during the first rain event. Seasons with a dry October/ November might require irrigation to increase the chance of blooming before February.

Almond growers host the largest pollination event in the world!

About 2 million honey bee colonies are placed in 1 million acres of California almond orchards for pollination. Prior to and after the almond bloom, supplemental forage can provide the necessary nutrients to build healthy and vigorous colonies for pollination of your crop.

Grower Benefits:

In addition to providing good nutrition that helps pollinating honey bee colonies stay strong, cover crop planting can be profitable to growers.

Benefits can include:

- Increased organic matter
- Nitrogen fixation
- Improved water infiltration
- Suppression of weeds
- Increased beneficial insects
- Increased pollinator diversity
- Reduced soil erosion
- Mummy nut decomposition
- Dust reduction
- Visual appeal

Suggested Areas to Plant

PAm Seed Mixes:

- Between tree rows
- Orchard borders
- Along roads or fence lines
- Along ditches and levees
- Fallow or unused land