

Intercropping Tomatoes and Vegetables

Weeds Growing Among Tomatoes



- These weeds are competing directly with the established tomato crop.
- They reduced air circulation and promoted the development of fungal diseases, which have defoliated the lower parts of these plants.

Intercropping Tomatoes and Greens



The Benefits of the Intercropping

- Intercropping lettuce and bok choy with tomatoes produces 3 crops while virtually eliminating niches for weeds on the production beds.
- The greens are ready to harvest just as the tomatoes enter their rapid growth phase and begin to occupy the whole bed.

Cover Crop Chart

GROWTH CYCLE

- A = Annual
- B = Biennial
- P = Perennial

RELATIVE WATER USE

- ☪ = Low
- = Medium
- ◆ = High

PLANT ARCHITECTURE

- ☪ = Upright
- ✱ = Upright-Spreading
- ≡ = Prostrate

-----Cool Season-----

-----Warm Season-----

---Grass---

---Grass---

-----Broadleaf-----

-----Legumes-----

A <u>Barley</u>	-----Broadleaf-----							A <u>Pearl millet</u>		
A <u>Oat</u>	A <u>Phacelia</u>							A <u>Amaranth</u>	A <u>Foxtail millet</u>	
A/P <u>Ryegrass</u>	A <u>Flax</u>	-----Legumes-----							A <u>Buckwheat</u>	A <u>Proso millet</u>
A <u>Wheat</u>	A <u>Spinach</u>	B <u>Turnip</u>	A <u>Field pea</u>	A <u>Berseem clover</u>	A/P <u>Medic</u>	A <u>Chickpea</u>	A <u>Sunflower</u>	A <u>Sudan grass</u>		
A <u>Cereal rye</u>	A <u>Kale</u>	A <u>Radish</u>	A <u>Lentil</u>	B/P <u>Red clover</u>	P <u>Birdsfoot trefoil</u>	A <u>Cowpea</u>	A <u>Safflower</u>	A <u>Teff</u>		
A <u>Triticale</u>	A/B <u>Canola</u>	B <u>Beet</u>	A <u>Lupin</u>	P <u>White clover</u>	P <u>Sainfoin</u>	A <u>Soybean</u>	A <u>Squash</u>	A <u>Grain sorghum</u>		
A <u>Annual fescue</u>	A/P <u>Mustard</u>	A/B <u>Carrot</u>	A/B <u>Vetch</u>	A/B <u>Sweetclover</u>	P <u>Alfalfa</u>	A <u>Mung bean</u>	P <u>Chicory</u>	A <u>Corn</u>		

Choosing the Cover Crop Mixture

- When cover cropping for long periods of time, combine a small grain (think cereal ingredients like oats, barley, rye) and a legume (nitrogen-fixing plant like peas or vetch) for best results.
- When cover cropping for shorter periods of time, consider green manure crops, or tender, quick-growing crops that will outcompete weeds and, when finished, will provide some easily-digested, supple foodstuff for the soil microorganisms. Examples include buckwheat and field peas.

How Long Will It Take the Cover Crop Residue to Decompose?

- Residue that is tender, like buckwheat or peas, will be assimilated by the soil organisms much faster than sorghum stalks or barley stems.
- Do you want to kill the cover crop and plant seeds as soon as possible? If so, consider a tender cover like buckwheat.
- Do you instead want to kill the cover crop and have its residue provide mulch on the soil for as long as possible? If that's the case, sturdier, carbon-rich crops like oats or sorghum are great options.

Which Cover Crops Suit Tomatoes?

- Because tomatoes pull a lot of nutrients from the soil, it is a great idea to precede the tomato crop with a leguminous cover crop, like field peas or clover, which will add nitrogen to your soil.

Which Cover Crops Suit Tomatoes?

- Tomatoes are heavy feeders, so you might want to grow a cover crop that adds nitrogen to the soil. In this case, a legume, such as faba beans (*Vicia faba*) or alfalfa (Lucerne), might be appropriate. If you want to add organic matter to the soil, use a grain, such as oats. Some gardeners opt for a mix of both. Legume crops need a soil bacteria to fix nitrogen from the air. To improve this symbiotic interaction, inoculate legume seeds with the soil bacteria, which is available at nurseries and garden centers. Some cover crops can become weedy if allowed to go to seed. Mow them down before they produce flowers and till them under.

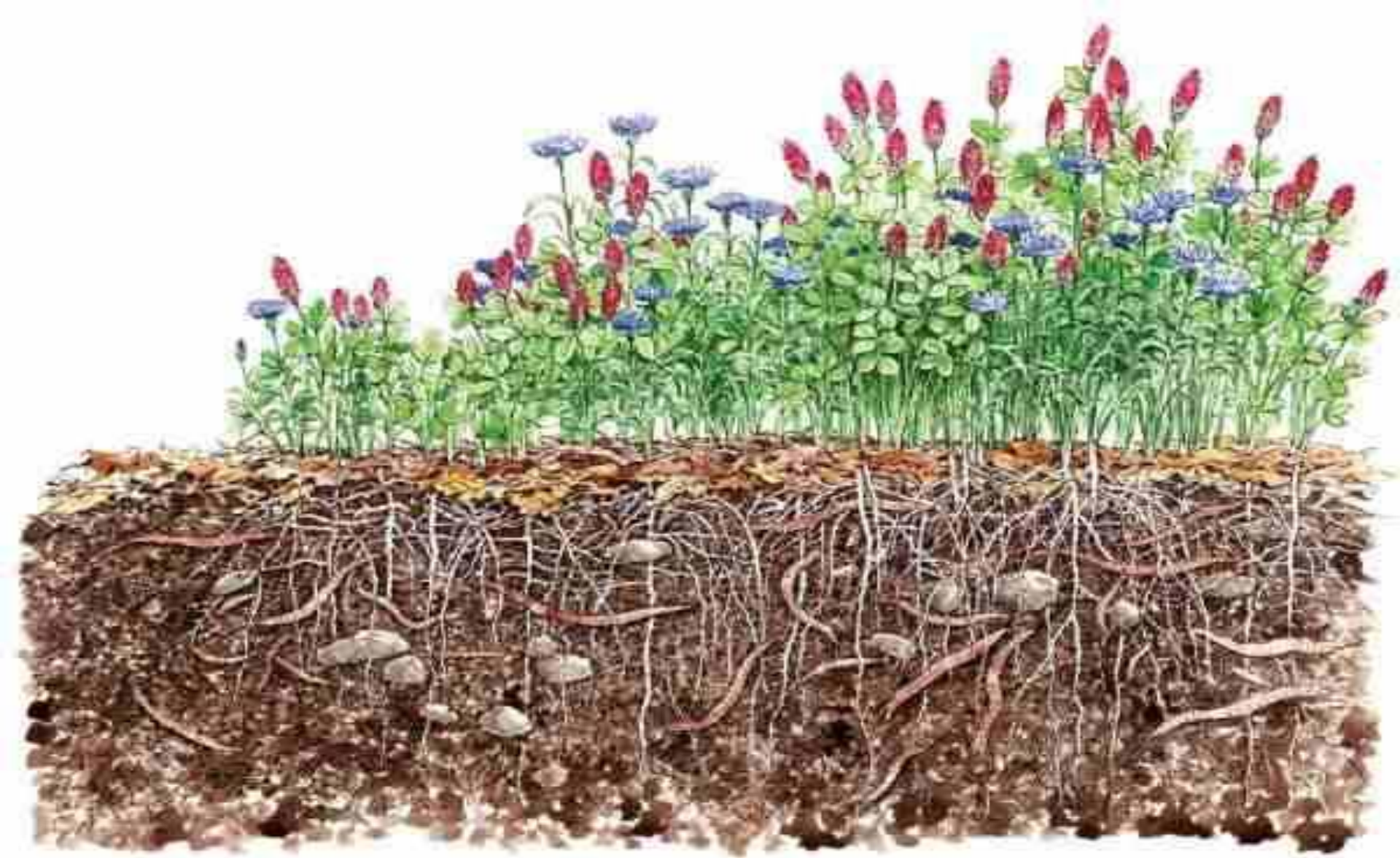
When to Plant After the Cover Crop

- When using a cover crop with tomatoes, you must till the cover crop into the ground 3-6 weeks before you plant the tomatoes.
- In the early stages of decomposition, cover crops take nitrogen from the soil. Later, they add nitrogen back. You want to plant tomatoes after early decomposition has taken place.
- Damping off diseases and other plant diseases are also more prevalent in the early stages of decomposition.

Mix All the Cover Crop Seeds



The Benefits of a Cover Crop Mixture



The Benefits of Planting Tomatoes with a Cover Crop

- Another form of intercropping alternates widely spaced rows of large vegetables like tomatoes with a cover crop, such as buckwheat.
- The latter is allowed to grow and suppress weeds for several weeks, then cut before it begins to compete with the vegetables, and left on the soil surface as a mulch that retards later-emerging weeds.

Intercropping Buckwheat and Broccoli



Prepare the Soil with a Cover Crop (Buckwheat)



Prepare the Soil with a Cover Crop (Clover)



Suppressing Weeds in Alleys with a Cover Crop



The Benefits of Planting a Cover Crop in Between Rows of Tomatoes

- A winter rye cover crop was planted prior to transplanting tomatoes. The cover crop, maintained by mowing, has suppressed alley weeds.
- Finally, cover crops can be planted in alleys between beds several weeks after vegetable planting (relay intercropping) to suppress weeds, protect soil, and add organic matter. Examples include buckwheat, cowpea, millet, or white clover, mowed if needed to maintain air circulation around the crop.

Mulch the Soil Between Tomatoes



Mulch the Soil Around the Tomatoes



Remove the Weeds and Then Mulch

- Many organic growers hoe or cultivate once or twice to remove early weeds, then apply 3–4 inches of straw, hay, or other organic mulch.
- This approach conserves soil moisture, adds organic matter, prevents soil splash during rains, and can provide excellent weed control in fields that are not heavily infested with aggressive perennial weeds or morning glories.

Use Mulch from the Cover Crop



Mulched Staked Tomatoes



Use Mulch from the Cover Crop

- Cover crops improve soil quality, provide nutrients, prevent erosion, moderate soil temperatures, conserve moisture, and help control insect, weed, and disease problems.
- This tomato crop benefits from a thick layer of mulch provided by a terminated rye cover crop.
- The farmer does not need to bring in straw mulch from off-farm as it might contain weed seeds. Producing his own mulch is better for this reason.

Tomato Plant Spacing

End Use	Vine Habit	Between Row Spacing	In-Row Spacing
Fresh-Market	Small-vined, staked	4, 5, or 6 feet	12-18 inches
	Small-vined, unstaked	5 or 6 feet	12-18 inches
	Large-vined	5 or 6 feet	18-24 inches
Processing	Determinate, unstaked	5 or 6 feet	6-9 inches (single plant) 9-12 inches (seeded in clumps)

Intercropping and Keeping the Soil Covered

Intercropping Leaving Bare Soil



Intercropping Leaving Bare Soil



Intercropping and Mulching the Soil



Intercropping and Mulching the Soil



Intercropping and Covering the Soil



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