



## How Much Water is Required to Create Pollinator Habitat in California?

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Creating multi-functional habitat on farms and ranches is rapidly increasing in popularity. Land managers are learning about the benefits they can achieve from installing temporary and/or permanent habitat and are integrating these strategies as part of their best management practices. Habitat loss is one of the leading causes of pollinator decline, which negatively affects yield. Research has also shown incorporating pollinator habitat into farming operations has numerous benefits beyond better pollination. These benefits include increased soil water holding capacity/infiltration, increased enemy insect populations which help control pests without the use of pesticides, decreased soil erosion, and better weed control. These practices also have positive effects on a global scale by sequestering carbon. By planting habitat, farms, processing facilities, and growing cooperatives are setting a high bar of responsible land management. Increasing the health of pollinators and other wildlife is a crucial part of helping the growing community to meet their long-term sustainability goals.

Developing habitat needn't be technically difficult or prohibitively expensive. However, proper planning and utilization of appropriate planting techniques and maintenance are important for success. The objective of this article is to address one component of habitat installation, irrigation. In California, the plants used to create hedgerows of pollinator habitat are native drought-tolerant species. Understanding the water requirements of these plants is often the first step in deciding the amount of habitat that is appropriate for each operation. A common initial question asked by those interested in planting habitat is "How much water will the habitat need?"

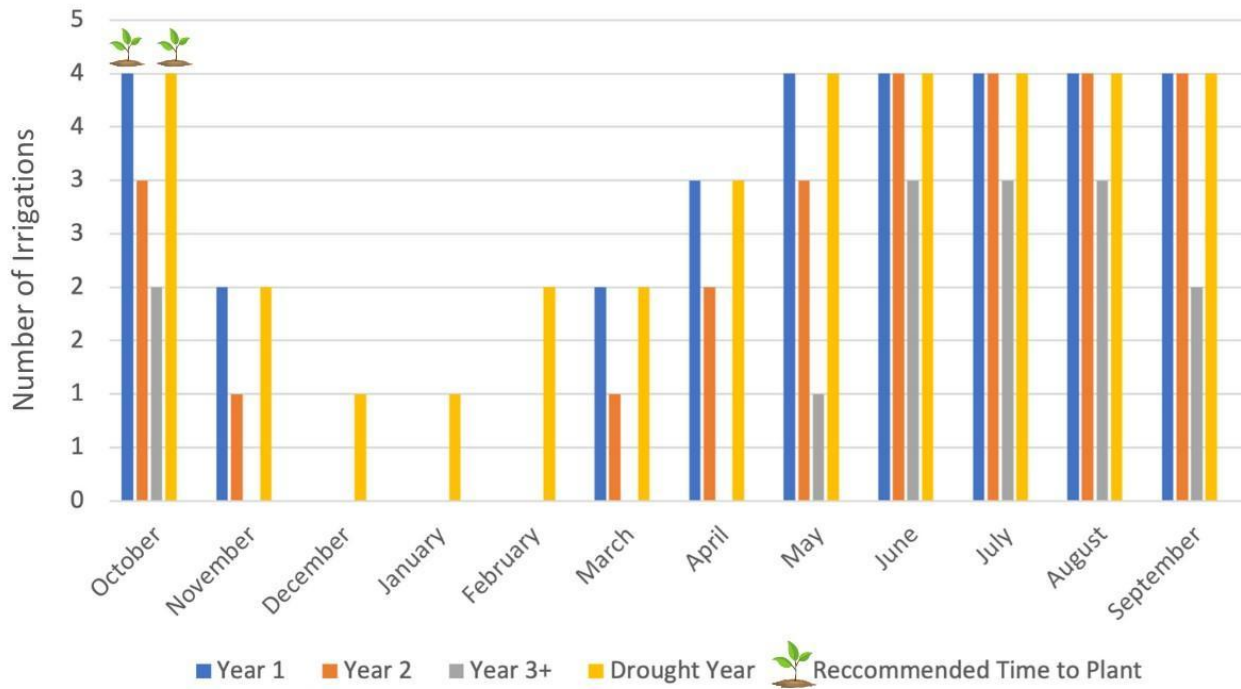
At first, it may seem straightforward. Identifying the water use of each species should be as simple as referencing the average precipitation in the region where it is native, right? Well, the real answer is more elusive because variations of annual rainfall amounts can be drastically different. For example, during the last couple of droughts in California, only habitat projects installed with a drip system on perennial hedgerows survived. Pollinator Partnership recommends using perennial species that have adapted to a hot and dry summer after they establish with adequate amounts of fall, winter, and spring rain. The

answer to whether the woody and perennial plants planted as part of permanent habitat require an irrigation system is a clear “Yes”. The remaining question about how much water will be needed is vaguer.

Temporary, short-term habitat has multiple benefits. Practices like cover cropping and conservation strips benefit pollinators, soil, and sustainability. These are temporary/short term habitats are accomplished by planting seeds of mostly annual species directly into the ground. With reliable consistency, these practices are successful without irrigation. Even during below-average rain years mother nature will provide enough. Long-term/permanent habitat, sometimes called hedgerows, is installed much differently by planting 6”-12” perennial plants that require irrigation.

The amount of water that will be needed for the irrigation system can vary widely. Let's dig into what to expect when planning a water budget for habitat creation. The water requirements for all the hedgerow species are low. However, they will need water during the non-rainy months (May-September) for the first 2 or 3 years. If experiencing drought, irrigation will also be required during the rainy season (November – April) It should be noted, the first year is when the risk of plant survival is at its highest, especially the first 6 months. The root zone of all newly planted specimens planted in the fall should remain moist until seasonal rains occur. Slight modifications in the water schedule will have to be made based on monitoring of the plants during establishment. Once plants reach maturity adequate irrigation can be as little as 1-3 times per month during the non-rainy season (May-September) and zero times per month during the rainy season. The frequency will vary depending on soil types. Sandy soil will drain faster thus requiring more. Soils with greater amounts organic matter or clay will hold water more efficiently thus requiring less. The following chart serves only as a general guideline about how many irrigation events will be necessary.

## Approximate Number of Irrigations Per Year



At no point during the year should any of these sites have standing water. Species like California lilac (*Ceanothus spp.*), Flannel Bush (*Fremontodendron californicum*), Manzanita (*Arctostaphylos manzanita*), and Silver Lupine (*Lupinus albifrons*) are notoriously susceptible to overwatering. Drought tolerant species will not do well if overwatering occurs during the summer, it will likely kill them. Different soil conditions can affect the necessary duration of each irrigation. The normal range is for 5-15 hours during each irrigation event depending on the flow rate of drip emitters. Land managers throughout the valley have achieved success with emitters ranging from ½ gallon to 2 gallon per hour. If run-off is a concern in soils with high clay content, it is advisable to switch to shorter irrigation times. Run the water until the area is saturated but does not run off. Sandy soils may never appear completely saturated so beware of over-irrigating in these situations.

Besides drip systems, other irrigation types can be used for hedgerows and other habitat projects. If full coverage of an area is desired, fan-jets or micro-sprinklers should be used. While they use more water, full coverage systems are ideal for simultaneously irrigating perennials in a hedgerow and seed-sown areas adjacent to it. Drip emitters have some limitations because they do not cover large patches of ground, which may be necessary to germinate and grow plants from seed.

Ready to get started or have questions? Pollinator Partnership and Bee Friendly Farming are here to help. We can assist orchardists, row crop producers, ranchers, and

managers of other working lands with selecting the appropriate practices which will improve efficiency and sustainability while supporting pollinator health. Customized habitat site plans are developed to guide managers as they navigate the challenges of site selection, site preparation, weed control, species selection, irrigation, planting method, and long term management. Please contact me, Billy Synk, Pollinator Habitat Specialist, at [Billy@Pollinator.org](mailto:Billy@Pollinator.org) for questions about adopting pollinator friendly practices into your operation.