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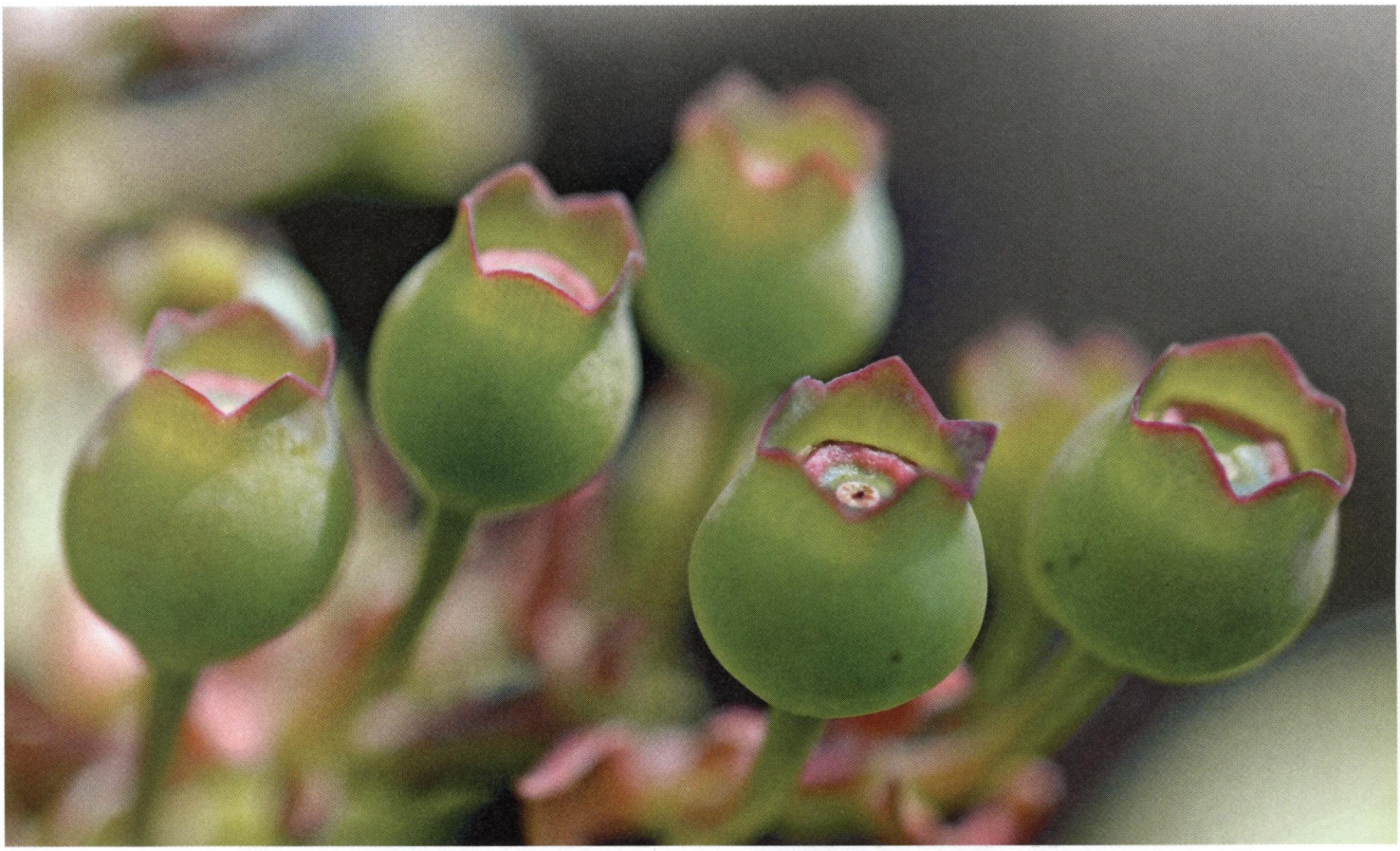

Collaborating with Gophers

Wildlife offers a lesson on the interconnectedness of nature.

Sierra Cascade Farm—one of the first certified-organic blueberry farms in California—is located at an elevation of 2,300 feet, astride a ridge where the Sierra Nevada and Cascade mountain ranges meet. It is a small family farm of 61 acres, with 8½ acres actively cultivated in highbush blueberries. For the past 20 years, my family's mission at Sierra Cascade Farm has been to produce blueberries of exceptional quality without the aid of outside inputs. With the exceptions of electricity to pump our water, fuel to power our tractor and trucks, and containers to package our fruit, our farm has become self-sustaining.

We apply no composts, fertilizers, herbicides, or pesticides—organic or otherwise. Nature has stepped in to take the place of many off-farm inputs; we rely on the native biological community to provide pest and disease control, pollination, and nutrients. In the process, we have reduced our operating costs, minimized our risk of crop failure, and increased farming profits. On our farm, natural biodiversity is an asset, not a threat to be eliminated.

Gophers are an example of wildlife providing benefits. When I first planted the blueberries, gophers moved in, digging tunnels under the young transplants. Agricultural literature identifies gophers as serious pests to blueberries, so I spent the next several springs digging into gopher mounds and trapping gophers. Eventually I noticed two things. First, I was not making much of an impact on the gopher population. Second, blueberry plants growing among gopher burrows were as large, healthy, and productive as those growing in areas devoid of gopher activity. I realized that the fibrous root system of blueberries stayed mostly within the top 12 inches of soil, while the vast majority of gopher tunnels were deeper than 12 inches.

By the time I gave up trapping gophers, the local coyotes,

***Above:** Blueberries must be pollinated—typically by bees—to form fruit.* ***Below:** Gophers dig tunnels that serve as habitat for native bumblebees.*

The author relies on owls, snakes, and coyotes to reduce the gopher population—an example of how a diverse ecosystem achieves balance.

gopher snakes, and owls had stepped in to replace my efforts with natural pest control. After several years of rapid escalation, the gopher population stabilized.

Because blueberries are native to North America, they evolved without the help of the European honeybee. Their long, narrow flowers are designed to accommodate native pollinators; honeybees must physically squeeze into the top of each flower to reach the nectar. To ensure adequate pollination, many blueberry growers saturate their farms every spring with rented honeybee hives. This is an expensive and risky proposition, because honeybees don't work in the rain or at temperatures below 55°F—conditions that can persist for days during the early-spring flowering season.

Another alternative is to promote native pollinators. Blueberries and bumblebees evolved together, and bumblebees are spectacular pollinators. They fly in cold weather, can easily reach floral nectar with their long tongues, and greatly enhance the transfer of pollen by vibrating the entire flower cluster at takeoff and landing. But unlike honeybees, which can be rented for a few weeks from commercial beekeepers, bumblebees must be enticed into your fields.

Fortunately, our farm is surrounded by wildlands that are rich in several species of bumblebees. Twelve years ago, when I took the leap of faith and cancelled my honeybee rental, I spent several anxious days waiting for the bumblebees to notice that my blueberries were flowering. I needn't have worried. The native bumblebees pollinated my crop that year and every succeeding year.

So what can a farmer do to protect and enhance this delicate dance between the bumblebee and the flower? The answer takes us back to my gophers. According to Robbin Thorp, Ph.D., professor emeritus in the department of entomology at the University of California, Davis, and a leading expert on bumblebees, the abandoned gopher tunnels provide habitat for bumblebees. Open holes give queen bumblebees access to the tunnel network. The nest cavity in particular might contain soft grass fibers mixed with fur and an enlarged chamber—ideal conditions for bumblebees. Letting gophers set up residence in my fields is one of the most important things I can do to ensure the proper pollination of my crop. —*John Carlon*

For more about biologically integrated agriculture, see OrganicGardening.com/bio-ag.