Prickly Pear Cactus Production

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The genus ***Opuntia*** includes the prickly pear, bunny ears, and beaver tail cacti. It is also called cactus pear and Indian fig (***fico d'India*** in Italian). You may have been intrigued by the seemingly erratic growth of the prickly pear cactus, with its pads protruding at all angles; or you may have avoided it because of its sharp, barbed spines and tiny stickers. Everyone, however, can appreciate the prickly pear's large but delicate and colorful blooms and the sweet, succulent fruit.

Over a period of several weeks in late spring and early summer, each pad produces several three-to-four-inch wide flowers that bloom in an array of colors, depending on the variety, from subtle to brilliant tones of yellows and oranges, pinks and reds. When the blooms fade, the edible fruits form.

While the prickly pear cactus is native to the United States, Mexico, and South America, it grows well in many areas of the world, including Africa, Australia, and the Mediterranean. In some areas of South Africa and Australia, it has become a notorious weed. It will grow at elevations ranging from sea level to 15,000 feet. Large commercial plantations thrive in Mediterranean areas, and the fruit is an important agricultural crop of Sicily. In California, the D'Arrigo Brothers plantation is located in Gilroy, off Heckler Pass Road.

Like most plants that thrive in a wide variety of areas, the prickly pear is tolerant of varied soils, temperatures, and moisture levels. The plants grow best in a sunny position in well-drained sandy loam with some protection from cold winter winds. Plants benefit from applications of a balanced fertilizer during their spring-through-fall growing period and, with excellent drainage, can tolerate almost as much water as any other cultivated plant. They are, however, drought tolerant once established.

The pads are actually rapidly-growing flattened stems. Depending on the variety, the pads will grow from four to 16 inches long, nine inches wide, and three-quarters of an inch thick. They may be elliptical to oblong in shape, bright green to blue-gray in color, and have a smooth skin. Most of the cultivated ones are spineless, but some have single inch-long white spines. Smaller stickers (glochids), cloaked in deceptively soft-looking fuzzy patches, will penetrate the skin at the slightest touch.

If you grow the prickly pear for its pads, feed with a high-nitrogen fertilizer. In warm climates, well-tended plants may be harvested of pads up to six times a year, and established plants may yield 20 to 40 one-half pound pads at each harvest. Remove the pads by carefully cutting them from their supporting pads. The best time of day to harvest the pads is from mid-morning to mid-afternoon, when the acid content in the pads is at its lowest.

If you prefer more flowers and fruits, give the plants a no-nitrogen fertilizer such as 0-10-10 once a month, even through the winter. During this dormant period, the plants require a bright situation and enough water only to keep the pads from shriveling. The cactus will bloom and set fruit from early spring through the summer, depending on the variety. Each pad can support numerous flowers, each yielding one fruit. Up to 30 blooms have been counted on mature pads, but 8 to 16 is a good number to allow for development of good-sized fruits. The fruits are ripe enough to harvest when the glochids fall off. Twist, rather than pull, the fruit from the pad to avoid tearing it. If the fruits are harvested unripe, the peel color will change some, but some of the sugar in the fruit will be lost.

Propagation

Opuntias may be started from seeds and will sprout readily if they are simply scattered in a shady garden bed and watered to keep the soil moist until germination. Seeds need a shady bed, whereas plants need full sun. However, growth from seed is slow, and three to four years may pass before flowers and fruits appear.

Propagation from pads is simpler and faster, advises Lorraine Thomas of K&L Cactus Nursery in Galt, California. From a growing cactus, cut a pad that is at least six months old, and allow it to form callous. This will take a week or two in warm weather but longer when the air is moist. Be sure to allow more time rather than less, to avoid rot. Sit the pad upright while it forms callous so that it will not curl. The cured pads may be dipped in a Bordeaux mixture to further protect them from fungal infection.

When planting the pad, settle it upright only about an inch deep in a mixture of equal parts of soil and sand or rough pumice. Planting the pad too deeply will encourage rot. In area with intense summer sun, situate the pad so that the slim side points north and south, and the broad side east and west. The sun will then pass along the narrow side during the hottest time of the day, and the pad won't sunburn. Anchor the pad in place with rocks to keep it upright, but do not water it(the moisture stored in the pad will enable it to sprout roots, and excess moisture may cause it to rot.

After a month, some roots will have formed, and the pad will stand firmly by itself in the soil. Water it once then, but let it dry between future waterings. Wait several months before beginning to harvest either pads or fruit, or future harvests will be lessened. Generally, the second or third pad to form will bear flowers and fruit, but a pad from an older plant may flower and set fruit sooner than a section from a younger, immature.

A Variety of Uses

Around the turn of the century, the plant scientist Luther Burbank researched many uses of the prickly pear cactus. Bob Hornback of Santa Rosa, California, has worked with the Luther Burbank collection for many years and done much to relocate and save specimens of these varieties. He has compiled a list of prickly pear uses from Burbank's research notes, circa 1914.

Prickly pear cacti can be grown into hedges and fences by planting them a foot or so apart. Within several years, the plants will grow together to form a wall of the spiny pads protruding at all angles (a barrier that will repel any intruder larger than a rabbit. Plantings can also be made for erosion control in deforested areas. In time, cacti plants such as ***Opuntia ficus-indica*** may grow into freely-branching trees from 10 to 20 feet tall.

The sap from the pads can be used in first aid similar to the aloe vera plant. Simply cutoff a portion of a pad, crush it, and squeeze the juice onto a cut, burn, or bruise. The sap will soothe the wound. Ground or pureed young pads are used as a laxative and also as a remedy for diabetes. According to Marita Cantwellde-Trejo, Extension Vegetable Postharvest Specialist at the University of California, Davis, the Mexican Institute of Nutrition in Mexico City is researching the hypoglycemic effect of cactus consumed by humans.

In Central Africa, the sap from the pads served as a mosquito repellent. In 1911, Burbank noted in Scientific American, that when spread on water, it smothers mosquito larvae, and the effect lasts up to a year.

The stickiness of the sap makes it useful in formulating various products. It can be extracted to make chewing gum and candles and is used as a stiffening agent for cotton cloth. A common use in rural areas of Mexico is to boil it down into a concentrate and mix it with whitewash and mortar to increase the durability of buildings.

Fresh pads provide a dependable source of food and drink for livestock and poultry. From 1906 to 1915, Burbank developed and promoted some 35 varieties of "spineless" cactus for this purpose. Charles E. Russell, of Texas A&I University, has studied some of these and other varieties as animal fodder in arid regions of Texas, Mexico, and Chile. Russell points out that the pads, when supplemented with a portion of cottonseed meal, offer all the moisture and nutrition an animal needs. Cantwell-de-Trejo adds that while there is a maximum amount of cactus pads that animals can eat (if pads make up over 50% of their diet, they will develop diarrhea), the pads may be the only source of food and water for range animals during times of drought or hardship. A wide variety of other animals has been successfully raised on the cactus pads. These include sheep, pigs, horses, ostriches (grown for their feather plumes), and at least one circus elephant.

According to Russell, the pads are a highly-prized commodity in the dairy industry of Mexico. When fed to dairy stock, the pads impart a distinctive flavor to the milk and butter, and these products are highly desired locally. A mutually beneficial barter system between cacti and dairy producers provides all the manure the cactus can use in return for all the pads the dairy stock can eat.

Other parts of the cactus also are useful. The pads can be pounded and dried, and the strong fibers woven into mats, baskets, fans, and fabrics. Pressed fibers can be used in making paper. The large spines are used as toothpicks, needles, and pins. Even the woody skeletons left after the fleshy tissues is dried can be used (in the construction of houses, rustic furniture, and assorted trinkets.

Before commercial dependence on synthetic dyes, cactus plantations were planted for the production of red pigments. The red-colored fruit of Opuntia streptacantha contain betacyanins (similar to anthocyanins) that are used for food coloring. Carminic acid ("cochineal" (is produced by the cochineal insect that feeds on the pads and fruit and is used in botanical stains and as a cloth dye. In the 16th century, the export of cochineal from Mexico was second in importance and monetary value only to silver. According to Cantwell-de-Trejo, there is a resurgence of

interest in these natural pigments. Also, some Indian groups dry the pads, flower buds, and fruits for later boiling and eating. Young flower buds can be baked and eaten.

Russell and Cantwell-de-Trejo concur that the prickly pear cactus is an underappreciated plant species, and they optimistically anticipate the development of future economic uses for both the pads and the fruit. Some possible uses, Russell suggests, include adapting the natural mucilage in pads as a soup thickener similar to agar, using the fruit's juice in various flavorings, and fermenting the juice into vinegar and wine (the distillate retains a wonderfully fruity aroma.

Culinary Uses

However, forbidding the spines, this cactus is definitely worth eating. The pads are "cladodes" or "nopales" when they're whole, and "nopalitos" when they're diced. They taste something like green beans. The fruits are called prickly pears, cactus pears, or "tunas."

Whether you add sliced or cubed pads to omelettes or gently urge the fruit from its stickery skin and eat it fresh or cooked into jelly, this cactus has much to offer. Even the seeds can be eaten in soups or dried and ground into flour. Recipes and entertaining and informative tips on preparation can be found in Joyce L. Tate's Cactus Cookbook, available from the Cactus and Succulent Society of America. Recipes range from appetizers, soups, and salads through entrees, vegetable dishes, and breads to desserts, beverages, and candies.

In Central Mexico, the pads have grown as a traditional vegetable since before the Spanish arrived. Today, the pads are available in this country throughout the year in specialty produce sections and at farmer's markets. The smaller young pads in the early spring are the most succulent, delicate in flavor, and have the fewest spines. Fresh pads are full of water and should be bright green and firm. To prepare the pad, simply hold its base and scrape the skin on both sides with a blunt knife until all the spines are removed. Then peel the pads and cut them into shoestring strips or dice them according to the needs of the recipe. They can be eaten raw in salads, boiled and fried like eggplant, pickled with spices, or cooked with shellfish, pork, chilies, tomatoes, eggs, coriander, garlic, and onions.

The flavor of a ripe prickly pear cactus fruit depends on the variety but include strawberries, watermelons, honeydew melons, figs, bananas, and citrus. You can eat them raw, at room temperature or chilled, and alone or with lemon juice. They can be cooked into jams and preserves or cooked down into a syrup as a base for jelly and candy (the "cactus candy" in some Mexican food stores. This syrup can be reduced even further into a dark red or black paste that is fermented into a potent alcoholic drink called "coloncha." The fruit pulp can be dried and ground into flour for baking into small-sweet cakes or stored for future use.

Individual taste preferences will dictate which varieties to choose for eating fresh and which for cooking. In Mexico alone, there are over 100 species with edible fruits. Sam Williams, a cactus enthusiast in Carmichael, California, says that while all the fleshy fruit kinds are edible, and none are poisonous, only a few are palatable and even fewer taste really sweet. They range from juicy to dry and sweet to acid. Cantwell-de-Trejo says that the acidity and fibrousness of the fruits are called "xoconochtlis" and are used in certain traditional Mexican stews and other dishes.

Fruit size, shape, and color vary from small and round like a walnut to three inches long and two inches wide like a rounded cylinder. Skin and flesh come in a rainbow of colors (white, green, yellow, orange, red, purple, and brown. White-skinned varieties are the most popular in Mexico, says Cantwell-de-Trejo, while the sweetest varieties generally available in this country have dark reddish-orange or purple skins and deep red-purple flesh. The fruit contains about one-half the amount of an orange. According to Cantwell-de-Trejo, this is its most important use in the diet of rural Mexicans.

The fruits ripen from early spring through late fall, depending on the variety. Those that are best for eating fresh ripen from September through November. Charlotte Glenn of Le Marche Seeds International in Dixon, California, who works extensively with gourmet vegetables, says that the perfect stage of ripeness of each fruit lasts only about a week, and the maximum shelf life of a fruit is only eight or nine days. Many of the fruits sold in California are imported from Mexico to extend the market season.

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