a deser place
from the CCIA Conservation Committee

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Everything about saguaro cacti

At this time of year when the stately saguaro (Carnegia giantea) is in full bloom, we become more aware of its imposing and majestic qualities as the dominant plant of the Sonoran Desert, and particularly of our unique Desert Foothills.

The sheer number of this cactus is striking evidence of its adaptibility and enduring survival admist the rigorous complexities of the desert environment. Admiration of this marvelous phenomenon of nature approaches reverence among the Papagos. This very existence of the saguaro becomes a miraculous revelation when consideration is given to the almost impossible and exacting interplay of natural forces required to insure the successful germination and development of its seed, and its growth to a mature plant.

Pollination is effected by bats at night, and doves and bees by day as the flower opens in the evening and closes the next morning. Pollination requires pollen grains from flowers from another plant or branch. Each saguaro, on an average, opens about four flowers a day for 30 days, and about half of these set scarlet fruit which ripens in about 36 days. Each plant therefore generates about 60 fruits of 2,000 seeds each. This amounts to about 120,000 viable seeds per season, or 12 million in an average production lifetime. Yet it is possible that not one of these seeds may survive to maturity.

Birds strip the fruit, and the pods which fall to the ground are relished by ants, ground squirrels, pack rats and coyotes. In a test of several thousand seeds spread on the ground, every seed was removed by red harvester ants from a burrow 60 feet away. However, some seeds pass unimpaired through the digestive tracts of animals and birds. Seeds passed through pack rats remain highly viable. Saguaros often germinate beneath palo verde trees due to the droppings of roosting or nesting birds. Other trees and shrubs, such as acacia and mesquite, offer the same conditions although less frequently. Seeds most frequently germinate and grow on the sunny south side of trees since the seed must have light to germinate, and shade to take root. (One might speculate that human encroachment has resulted in fewer palo verde trees, resulting in fewer saguaros.) In addition, temperature and moisture are extremely important. For the seed to burst into life the temperature must be about 77 degrees Fahrenheit. None develops if the temperature is below 59 degrees or over 95 degrees. Because of desert night cooling, a fine balance must be reached. And rain must fall at least twice within a five- to seven-day period, with a total of at least one-half inch.

Under these various stringent and exacting conditions the net loss of seeds is tremendous. Less than 1 percent ultimately becomes seedlings, and these have a higher mortality rate than do the seeds. For the first few years the seedlings are less than one-inch high with roots about the same depth into the soil. Every unshaded seedling dies. The slightest disturbance is disastrous, and as commonplace as trampling by grazing animals. Insects, especially larvae of weevils, and probably most important of all, rodents ravage the tiny plants. Drought, erosion and frost also deplete the seedlings.

Since the various conditions required for successful growth described above are not often in harmony, and highly unlikely to occur by chance each season, we find saguaro populations of distinct and obvious height differences. This indicates possible 20- to 30-year periods of unsuccessful productive conditions in the life cycle of the plants.

Having survived the vicissitudes of propagation, the growing plant must overcome further hazards. Cold is an imposing foe of this desert giant and it therefore grows best on the south sides of desert foothills. Some authorities believe that freezes on at least five consecutive nights can cause permanent physiological damage. Although this may not be immediately apparent, death may result within 20 or 25 years due to the inability of the plant to stave off bacterial infection. This will manifest itself as a bacterial necrosis disease evidenced by a thick, black, oily sludge seeping from the plant.

An additional hazard is the vulnerability to windstorms. Since the roots are a lace-like proliferation close to the surface of the soil, they offer poor anchorage. This menace especially increases after prolonged or heavy rains when the plant is fat with water. In one cactus forest in Sonora, more than half the saguaros were blown over, all flat on the ground and pointing in the same direction.