

Growing Cacti From Seed  
Echinocereus coccineus  
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What follows are directions on how you can germinate seeds and grow cacti. I've tested the cactus seeds you were given at this 2024 Labor Day Show of the Cactus and Succulent Society of New Mexico at the Albuquerque Botanical Garden. They gave me almost 50% germination.. That's very good for wild-type seeds. Various observations from my about 50 years of growing cacti from seed are below.

You've picked up a packet of 100 seeds of the cactus species *Echinocereus coccineus*. I want to tell you more about this cultivar. The genus *Echinocereus* is found in the US Southwest. It's genus name (*Echinocereus*) translates from the Greek as something close to "spiny candle." The species name (*coccineus*) translates as something close to "scarlet" This is a very widely-spread species in the American Southwest. There is an isolated population in the Jarilla Mntns. of New Mexico, south of Alamogordo. This population is noteworthy because it has many different flower colors , as opposed to the rest of the herd outside the Jarillas that has scarlet flowers. There are many or few spines per areole. (An areole is the defining feature of the plants called "cactus." It's the biological organization which gives rise to the sharp things that cacti have, called spines. Spines are modified leaves. But spines are not the only structures arising from areoles. Flowers also arise from areoles. Other plants have sharp things emerging from their stems, usually called "thorns." These are modified stems. Only cacti have areoles.) The mode of growth of this species is it puts up a stem of maybe 8 to 10 inches, maybe a foot. Then it starts to clump out. I've seen a single clump having about 500 stems in the desert. This is technically one plant. It's probably more than 100 years old. If you don't want to wait 100 years, treat your plant(s) with loving kindness. Water them and fertilize them (combine the two!). Don't be afraid. The typical *E. coccineus* one sees in the front yards of Albuquerque are a foot or two (very old!) in diameter. In the end, you can just carve off any of the outer heads as you please. You own the plant. Control it.

It happens that *E. coccineus* is quite winter hardy. I have five of them in the ground in Los Alamos now, for years. No winter kill problems. You could actually germinate the seeds now and leave whatever seedlings you make outside all winter. But, be cautious. Cacti - indeed, all plants - are at their most vulnerable as seedlings. It would be wise to put the tiny things you'll have by first frost in a protected place if you decide to overwinter them outside. It's quite possible that a seedling might be one that could not survive the winter when very young would easily survive for a long time if allowed to grow larger with protection as it goes through the seedling stage.

I'll leave further general lessons on cacti and other xerophytes for you to look up on the web. When I was a boy so many years ago, I had to go to my local library for answers to my questions. Today, the

internet is at one's fingertips. Google "Albuquerque cactus club" and the first item to come up is the home page of "The Cactus and Succulent Society of New Mexico." The abbreviation "cssnm" also works. Lots of member-generated information is there.

Back to how to grow the seeds you picked up today at the Botanical Garden: You need to get some sort of proper soil. Straight dirt may not be suitable. The most characteristic property of cacti is that they seem to prefer a drainy soil. That is, something which allows water to easily run through it. All of us seed-growing cactus nuts have our favorite soil. I won't bug you with my favorite. The whole story is looseness. Water and air (the real point, I think) must easily run through the soil. This could be straight perlite (buy at Home Depot, etc.), straight pumice (buy as above; maybe steal from volcanic road cuts found across New Mexico), or vermiculite, as above. I know a person who uses only the small gravel sold in pet shops as fish tank soil. Some people use builder's sand from Home Depot, sold in small bags. You should not use this as it is sold. It's about 70% fine sand that will make it hard for air to get at the roots of the cactus seedlings. To fix this problem, run the sand through a kitchen sieve. Throw away the fine stuff that runs through the sieve. Use the coarser grade that remains in the sieve. Alternatively, rather than buying anything, you could use native New Mexico soil. Were I to do this, I would sieve the stuff as just described. The CSSNM website has some artificial soil recipes that some of the members use. I've never used naturally occurring soil in my 50 years of cactus growing. I have some surviving plants from my start 50 years ago. They've never been in dirt and the only food they've been fed has come from a hardware store or garden shop. Some of these plants are over six feet tall. Whatever medium you choose, put it into some smallish pot - a cut-off styrofoam coffee cup which will hold 2 inches deep of soil and having some small holes cut into the sides near the bottom for drainage, will do. Scatter the seeds on the surface of the soil and gently water. Don't cover the seeds. Many books tell the reader that cactus seeds need light to properly germinate. I'm not sure that this is true, but I do know that light does not retard germination. Be careful. Baby cacti can't stand direct sunlight. Put this pot into dappled shade. That is, someplace that gets some sun, but mostly modulated sun. Water these seeds once a day for the immediate future. You should try to develop a gentle water addition technique. The ungerminated seeds won't care, but the seedlings you make will have a very tiny thin root that is the start of the plant feeding and getting water. If you water too vigorously, the root gets torn off by the force of the water, and the plant must expend energy and food making a new root. This happens of course in nature every time it rains, but you're not nature. Try to baby the babies.

(The serious cactus seed grower has used 4-foot fluorescent lamps for gentle light that approximates dappled sunlight. A few years ago I tested my fluorescent tubes vs the newly available LED lamps, made to look like fluorescents, for growing from seeds. There was no significant difference that I could see. Actually, I thought the LED seedlings looked better. I pitched all my fluorescents and now

use LEDs exclusively. The main advantage is that the LEDs are much cooler than fluorescents since LEDs require no ballast. Ballasts give off lots of (waste!! )heat.)

After about six to seven days, you will notice some tiny white to pale green to pale pink things on top of the soil. This is the seeds germinating. Keep on daily watering. After about 2 weeks, start to water with dilute fertilizer. I use water- soluble 20/20/20 (N-P-K) with trace elements that you can buy at Home Depot or Lowe's, or probably any hardware store. Here's the trick - this solution must be very dilute. I use 1/8 teaspoon of fertilizer per gallon of water. Don't use more for any plants you fertilize. And the numbers are not important; any numbers, not zero. N-P-K are ok. The plants will take what they need and just let the rest pass through. The presence of trace elements is important, so try to get an N-P-K formulation having trace elements. The label will tell you if the container has trace elements. Trace elements are as important for plants as for us people. If you somehow live in a place that has no access to iodine for whatever lives there, you will eventually get very sick. You won't die immediately, but you might think of dying as a result of your iodine deficiency. (Ordinary table salt is enriched in iodine by law to avoid the people living inland from the oceans developing iodine deficiency.). There are lots of trace elements that are necessary for plant and animal life. Much the same elements for both. Plants and animals are almost biochemically identical. The main difference is that plants can use sunlight to make the carbohydrate called glucose. Animals have to eat plants to get their necessary glucose. Both organisms need glucose to live.

Alternate fertilizer and just water. Don't feed with fertilizer constantly. Maybe a day of fertilizer and two days of just water. Then maybe 1 to 1. Then after about six months, just dilute fertilizer with maybe straight water every third watering or so. The point of the straight water is to flush the waste given off by the roots out of the pot. When you water, it's good for water to drip out of the pot. One thing I've noticed in my 50 years of cactus seed growing is that the little plants at first seem to not be cacti at all. That is, they need lots of water like normal plants. Then, depending on the species, they suddenly realize that they're cacti. They are no longer happy with constantly wet soil. They start dying to tell you this. My experience is that this happens, depending on species, about six months after sowing. At that point, water every 4 days or so, until after 8 more weeks, water every week or so, These numbers are not a recipe for success. Your growing condition may dictate other intervals. This will be what you have to learn. I've lost hundreds of thousands of baby cacti over my 50 years of growing cacti from seeds. Their death is them talking to me demanding that I learn how to grow them better.

I would like to hear about your experiences with these seeds. I'll be at the next CSSNM Show and Sale (FREE!) at the ABQ Garden Center the second weekend in April, and at this Arboretum show next Sat/Sun of Labor Day Weekend.