



*Example of a grown-out clump-flat (center), in this case Mammillaria spinosissima.*

**The Theory Behind the Clump-Flattening Procedure in Cactus Production.** Although cactus seeds are easy to germinate, the seedlings are usually slow growing, remaining little bags of protoplasm on the surface of the growing medium for a very long time. In greenhouse production of other types of plants, it is common procedure to direct-seed into pots or into little chambers of thin plastic, styrofoam, or other material so that individual transplants will be obtained, each with a healthy root system in a square, cylinder, or cone of growing medium. In the alternative, a whole flat without divisions may be seeded, with the intent to prick out the seedlings for individual potting later.

Although the procedure described above could be applied to cactus production, the results are greatly inferior to those when the clump-flattening procedure is used. Cacti are normally seeded several thousand to an undivided flat and grown for a few months or even longer without disturbance. If grown for an extended period of time, the mass of seedlings may “bubble up,” with portions separating from the flat and growing medium. Normally the plants are taken from the seed-flat in clumps of 7–9 seedlings to go into what is referred to as a clump-flat.

Normally this second flat is “clumped out” in seven rows each having seven loci to receive a total of 49 clumps per flat. A

single seed flat will produce quite a few clump flats. As the seedlings grow they eventually occupy the total surface area of the flat once more and the clump-flat again resembles a grown-out seed-flat but with much larger (but fewer) plants. When a clump flat is mature or “ready,” the individual plants of the clump are separated and either placed into pots or “single-set” into a third flat, usually in ten rows of eleven plants each.

The theory behind the clump-flattening procedure has several facets relating to efficiency of space but also to better growth of seedlings when they are aggregated and relatively undisturbed. In separating clumps in a seed-flat, only the roots at the edges of the clump are disturbed. Also, the sides of the seedlings, having been pressed against each other in the seed flat, will be exposed to new intense light levels only at the edges of the clumps. Such light shock also tends to interrupt growth. The rule in cactus culture is never to overpot—the soil around a small cactus in a large pot stays wet too long and the plant may die. Thus, the crowded nature of plants in a clump-flat allows the flat to be watered more often with a higher percentage of the water being actually used by the plants. Clump-flattening allows a much more efficient use of space for slow growing plants which seem adapted to passing seedling stages in aggregations.

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