

## Priming Seed to Enhance Germination

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**S**eeds vary in their ability to germinate. The process of treating seed in an aerated salt solution or an aerated solution of polyethylene glycol prior to sowing of the seed is referred to as osmotic priming. Osmotically primed seed germinates sooner and under a wider range of temperatures than untreated seed. The result of the more rapid germination is greater uniformity, especially when temperatures are less than ideal. This technique has also been used to overcome certain types of seed dormancy.

The priming process causes germination to begin in the seed while restricting water movement into the seed. As a result the final step of germination, the outgrowth of the seed root, is prevented because the seed is unable to take up enough water for cell expansion to occur.

Seed priming agents include; polyethylene glycol (PEG) 8000, potassium nitrate ( $KNO_3$ ) alone or in combination with monopotassium-phosphate (MKP) and table salt ( $NaCl$ ). A typical solution is prepared by adding 1

ounce of  $\text{KNO}_3$  to water to form 1 quart of solution. A bubbling stone is placed into the solution along with the seed and the seeds are aerated for 7 days at room temperature. After priming, the seed is rinsed with clean water and then either sown or immediately dried. Dried seed can be stored as long as 6 months. PEG solutions of 6.9 ounces per quart of solution can also be used.  $\text{KNO}_3$  and MKP solutions consist of 1/2 ounce of each salt in a 1 quart solution.

A seed priming system, capable of priming a number of different types of seeds simultaneously, has been published by Akers and Holley (1986). This system uses a manifold to bubble air through individual PVC columns, vertically arranged in an aquarium. A good way to test if seed priming can be an effective tool for your operation is to prime a small quantity of a hard-to-germinate species or a species which tends to germinate slowly and irregularly. After priming, note how effective the treatment is relative to untreated seed under your conditions.

Primed, pelletized lettuce seed from Royal Sluis (Salinas, Calif.) represents one of the few commercial sources of primed seed. Monopotassium-phosphate is available through some greenhouse supply companies such as Hydro-Gardens in Colorado or chemical supply companies such as Sigma, which service tissue culture and scientific laboratories.

### References.

Stuart W. Akers and Kevin E. Holley. 1986. "SPS: A System for Priming Seeds Using Aerated Polyethylene Glycol or Salt Solutions." HortScience 21(3):529-531.