

On-farm seed priming – what is it?

Standard methods of seed priming in which seed is soaked then dried back to its original water content, were developed for temperate horticultural and agricultural crops. The approach is useful for crops where germination, emergence and seedling vigour are constrained by cool, wet soils. Under these circumstances, priming advances germination by inducing a wide range of biochemical changes in the seed, the products of which persist following desiccation and are available quickly once seeds are re-imbibed.

Such methods are energy- and technology-intensive and are generally provided by specialist companies in developed countries as 'value-added' services for seeds supplied through the formal sector. Priming is costly and largely unavailable to farmers in marginal tropical environments where the majority of seeds come from farmers' own stocks or are obtained through informal, local arrangements. In addition, seeds in the semi-arid tropics are sown into hot, drying soils where potential metabolic rates are high but lack of water is the main constraint. In such situations the pre-hydration of seeds should be the main purpose of seed priming, although biochemical advantages may also be important.

Farmers can prime their own seed if they know the safe limits. The safe limits are calculated for each variety so that germination will not continue once seeds are removed from the water. A primed seed will only germinate if it takes up additional moisture from the soil after sowing. It is important to note this distinction between priming and pre-germination-sowing pre-germinated seed under dryland conditions can be disastrous. In most cases seed can be primed overnight and is simply surface-dried and sown the same day. Apart from swelling slightly and weighing more, primed seed can be treated in the same way as non-primed seed. Occasionally, sowing may be unavoidably delayed – by heavy rain, for example. If primed seed is surface-dried and kept dry it can be stored for several days then sown as usual and still perform better than non-primed seed.

Research so far suggests that some of the effects of on-farm seed priming can be obtained by using sophisticated methods of seedbed preparation and sowing. Planters that ensure good seed-soil contact encourage good establishment. This may partly explain why the benefits from seed priming are often more evident in farmers' fields than on research stations.

Fast germination and emergence result in rapid development of seedling root systems while soil conditions in the surface layers are still relatively favourable. Without early checks to growth, vigorous crops result.