Seed Treatment

Superabsorbent Polymer (SAP)
Water management for improved seedling success

The Benefits of Superabsorbent Polymer (SAP)

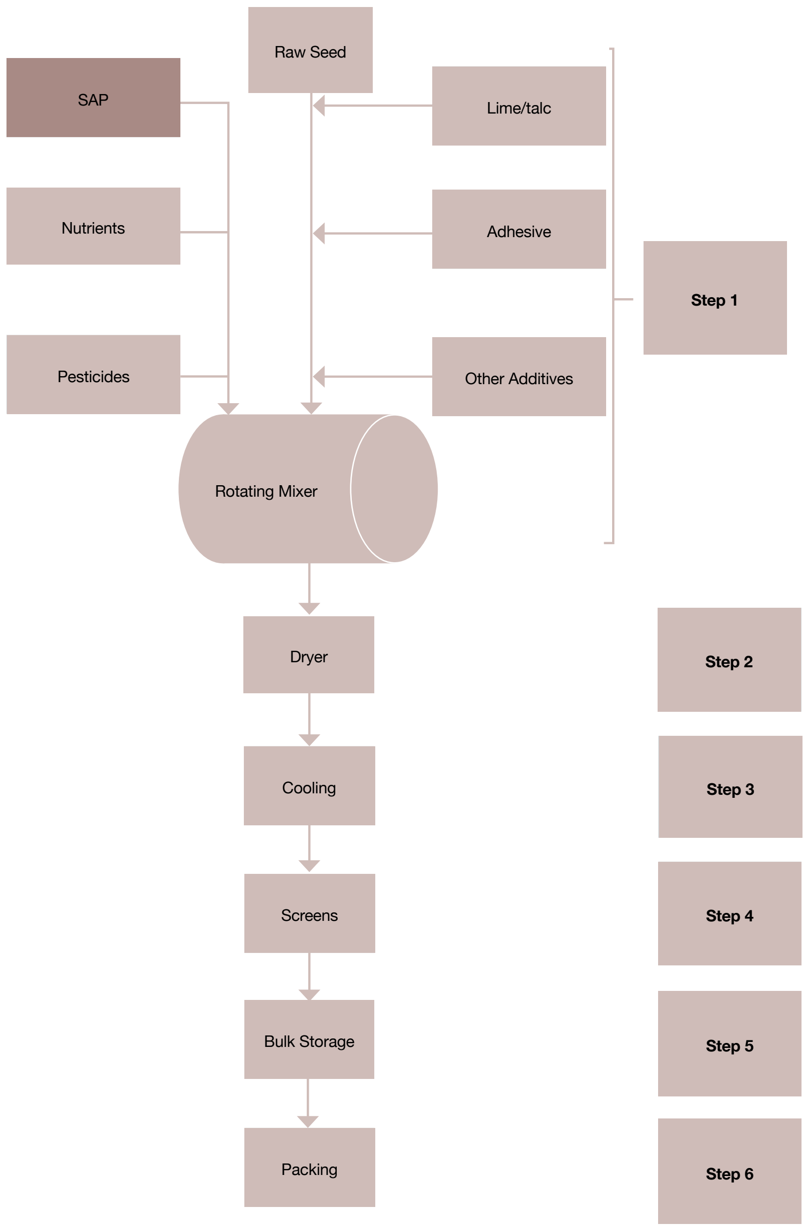
Developed exclusively for the agriculture and horticulture industries, Superabsorbent Polymer (SAP) is a proven water management tool for growing plants. Field and laboratory tested hydrogels have been proven effective in absorbing many times their mass in water for optimal plant growth. As a seed treatment, SAP can improve seedling germination, survival and growth while delaying seedling stress from drying field conditions.

Generalized Manufacturing Procedure

Uniformly treated, dust free seeds are necessary for modern precision planting equipment. Thus, most seed processing is conducted on a batch basis in which a rotating mixer has all constituent materials uniformly metered into the system. The sequence of presentation and combination of constituent materials will vary. Thus, the information provided herein is a general guide that should aid in process development.

In dealing with SAP, it is critical that little to no water be used so as to avoid excessive hydration, which will clump the seeds and gum up the system. Whenever possible the product should be blended in as a dry powder. SAP powder products are readily available in a particle size of less than 200 microns, but finer milling can be conducted if necessary. Temperature control is important to preserve seed viability and will suffice to assure polymer stability. If it is possible to delay introduction of a sticker, such as polyvinyl alcohol, it should be considered as a final component to provide a protective covering of the finished seed. Any consideration that will delay in-field hydration will promote success for the finished, treated seed. Our team of technical experts is available to assist in determining proper formulation and process development.

Generalized Manufacturing Flow Chart



Step 1. All constituent materials are introduced. Raw seed is first, generally followed by lime or talc, which adds bulk and uniformity to small seeds. Next the SAP is added, then the adhesive. Other additives (i.e. coloring, nutrients and/or pesticides) are applied as appropriate. In some circumstances these additives may be blended prior to adding them to the rotating mixer. As an example SAP could first be blended with the limestone or talc to minimize dust. Stickers, wetting agents and flow materials will vary. The rotation speed will influence dwell time in the mixer and must be determined for each formula.

Step 2. The treated seed is now discharged from the mixer and conveyed through a heated air system to remove moisture. Temperature and dwell time are variables to be determined.

Step 3. Product is moved out of dryer into ambient cooling system.

Step 4. Screens are used to separate out clumped seeds and small particles to assure uniformity.

Step 5. Finished treated seed is moved to bulk storage.

Step 6. Finished seed is packaged.

Note: The ideal delivery system should be an enclosed delivery hopper that could avoid the chance of inhalation and excessive production of dust during processing.

Variables for development of a SAP seed treatment:

- SAP particle size
- Seed surface chemistry compatibility with SAP
- Additional flow, production, and application chemistries
- SAP attributes: absorption, retention, absorb release cycles, etc.
- Seed capability to accept 1-2% SAP load
- Product registration
- Dust mitigation/elimination in production
- Hygroscopic concerns
- Packaging and long-term storage consideration
- Seed treatment timing as related to sales & use proximity
- Production efficiencies and overall economics

GREENER SOLUTIONS INTERNATIONAL
AGRICULTURE & HORTICULTURE SOIL SOLUTIONS

Greener Solutions International | P.O. Box 1373, Hebron, CT 06248
Phone: 860.368.9643 | gsigreen.com | info@gsigreen.com