

BiOWiSH™ Crop Liquid: Pilot Scale Fertilizer Coating

Step by Step Protocol for Pilot Scale (<1 metric ton) Coating of BiOWiSH™ onto Solid Fertilizer

EQUIPMENT

1. Mixer (rotary, paddle, ribbon)
2. Sprayer (hand pump or air driven)
3. Scale or balance for weighing
4. Buckets and weigh boats or cups for weighing material

MATERIALS

- BiOWiSH™ Crop Liquid or BiOWiSH™ Crop Liquid Green Choice
- Solid fertilizer sample (urea, ammonium nitrate, DAP, MAP, fertilizer blends, compound fertilizers, biosolids, limestone, etc.)
- Drying agent (Calcium Sulfate, Calcium Carbonate, Bentonite)

PROCEDURE

1. Make sure all the equipment is thoroughly clean and dry.
2. For weight based delivery: Using a bucket, weigh out the amount of solid fertilizer to be coated (for this example we will use 50 kg of Solid Fertilizer):
 - a. CALCULATIONS FOR 50 kg OF SOLID FERTILIZER
 - i. BiOWiSH™ Crop Liquid is applied at 0.2% by weight:
 $0.2\% * 50 \text{ kg} = 0.1 \text{ kg}$ or 100 grams per 50 kg.
 - ii. Drying agent is applied at twice the level of the BiOWiSH™ Crop Liquid:
 $0.4\% * 50 \text{ kg} = 0.2 \text{ kg}$ or 200 grams per 50 kg.
3. For volume based delivery: measure out the volume of solid fertilizer to be coated.
 - a. CALCULATIONS FOR VOLUMETRIC DOSING
 - i. BiOWiSH™ Crop liquid is applied at the equivalent of 2L per 1000 kg. For 50 kg of fertilizer apply 100 mls of BiOWiSH™ Crop Liquid.
 - ii. Drying agent is applied at 0.4% by weight or 4 g/kg. When dosing by volume, this weight needs to be divided by the density of the drying agent to get the number of cubic centimeters of drying agent required (e.g. $4/\text{density} = \text{cm}^3/\text{kg}$).
 01. Density of calcium sulfate = 0.72 g/cm^3
 02. Density of calcium carbonate = 0.70 g/cm^3
 03. Density of bentonite = 0.80 g/cm^3
4. Place the solid fertilizer into the mixer.
5. Measure out the required amount of Drying Agent (either in grams or cubic centimeters).
6. Before dispensing, **vigorously mix the container of BiOWiSH™ Crop Liquid.** For 2.5 gallon jugs this can be done by inverting the jug several times. There should be no visible solids at the bottom of the bottle.
7. Add between 200 and 500 milliliters (or grams) of BiOWiSH™ Crop Liquid to the sprayer. Fully assemble the sprayer and prime it. If using weight-based dosing, weigh and record the weight of the sprayer. If using volume based dosing, note the starting volume and define where the final volume should be after delivery.
8. Turn on the mixer.
9. Begin spraying the BiOWiSH™ Crop Liquid onto the rotating solid fertilizer bed. Avoid spraying onto the mixer blades or sides of the mixer.

10. For weight-based dosing, frequently stop spraying and re-weigh the sprayer unit. Subtract the weight from the initial weight recorded in Step #6. Goal is to deliver the equivalent of 0.2% or 100g per every 50 kg of solid fertilizer.
11. For volume-based dosing, spray until the volume in the sprayer has dropped to the final level. Goal is to deliver 100 cm³ per every 50 kg of solid fertilizer.
12. Once the required amount of BiOWiSH™ Crop Liquid has been added (for 50 kg of solid fertilizer the required amount is 100 g or 100 cm³) stop spraying and allow the mixer to run for 2 minutes.
13. After 2 minutes of mixing, with the mixer still running, add the required amount of drying agent (for 50 kg of solid fertilizer the required amount is 200 g or the equivalent volume based on density).
14. Allow the mixer to run for another 2 minutes.
15. Coating is complete. Empty the coated solid fertilizer into buckets or other holding container until ready for use. Keep the containers sealed until use. Do not store the coated fertilizer above 40°C for extended periods.

For coating fertilizer batches of 1 ton or greater please refer to the User Guide BiOWiSH™ Crop Liquid: Large Scale Fertilizer Coating.

Note: BiOWiSH™ Crop Liquid Green Choice is also available for coating urea. The application process is the same as defined above.

CONTACT

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