

Tech Shares

Best Practices for Blending

Calibrating the blending of ICL Specialty Fertilizer products into growing media

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Osmocote® controlled release fertilizer (CRF), Peters Professional® UniMix® Granular growing media nutrient charge or H2Pro™ Granular wetting agent provide excellent benefits and save labor when incorporated into growing media. Proper and uniform dosing and mixing of granular components throughout the growing media is critical to guarantee you receive the full benefits of these value-added products. The best way to check and confirm dosage and uniform distribution of products is to do a calibration of your mixing system. This will ensure that you are adding the right amount of product uniformly into the media resulting in even distribution into every container.

Measuring Volume

Recommended application rates are found on our products labels, web site and product sheets. Rates are determined by weight and analysis of the fertilizer or wetting agent per unit volume. The first step in checking your blending system is to measure the volume of growing media you are mixing. There are a variety of methods to blend potting mix, but two major methods are pad mixing and mixing lines. There are several ways to estimate growing media volume and then calibrate addition rates of fertilizer or wetting agents:

Pad Mixing – bark and other components are often mixed on pads via front-end loaders. Mix is measured in bucketful's and spread out evenly on a pad, granular components are broadcast over the top of the media; then mixed with the front-end loader. The key to calculating how much fertilizer or wetting agent to broadcast over the pad and media is to estimate the volume of the pile in terms of cubic yard.

Estimating Volume of Pile

- Contact your equipment manufacturer get the bucket specification – a Bobcat scoop will hold approximate ½ cu. yards and some larger equipment buckets can hold up to 4 cu. yards.



- One can measure the actual volume of each bucketful using a one cubic yard box. To determine the bulk density of the mix:
 1. Fill a 1 cubic foot or 3 cubic foot box to level without significant compression.
 2. Weigh several filled boxes to obtain an average bulk density (lbs./ cu feet).
 3. Weigh the front end loader on a truck scale with bucket empty, then full to determine the actual weight of a bucket.
 4. Then figure out the actual volume of a bucket, based on the average bulk density per cu. foot.

Checking CRF/ wetting agent addition rates – once you know the volume of the pile; check the product label for target addition rate.

- Example: Your pile is 50 cu yards, Osmocote® Plus medium label rate is 12 lbs. per cubic yard, so the total amount of CRF needed = $50 \times 12 = 600$ pounds or 12 bags. Product should be evenly spread around the media surface; then mixed in repeatedly until a uniform distribution of granules occurs.
- For smaller volumes of soil requiring less than a full bag of fertilizer, growers will often use a scoop or can to dose fertilizer. This will work fine as long as you first measure the actual weight of a full scoop or can so you know you are delivering the target rate of granules.

Growing Media mix lines – growing media is also made on continuous mix lines with hoppers and a conveyor belt. Calibration of granular components being blended in a mix line can be implemented several ways.

Growing media volume output determination -

- Some mix line software automatically determines the volume of coming off a mix line in a given time interval (e.g. cubic feet or yards per minute).
- A second method is to run a line and using a stopwatch record how long it takes to collect a yard of mix off the end of the line. This is the volume output per unit time (e.g. cubic feet or yards per minute).
- Hopper dispersion gates can then be set to deliver the fertilizer or wetting agents at the proper rates.
- Otherwise it is easy enough to estimate the output of a mix line with a few measurements.



1. The volume can be calculated by multiplying length x width x height. Measure the dimensions (depth and width) of mix on belt. Example: mix on line is 4" deep and 18" wide on belt. In this case each 12" of belt length would carry $4 \times 18 \times 12 = 864$ cubic inches or $\frac{1}{2}$ cubic feet.
2. The second piece needed is how fast the belt travels in a defined period of time (e.g. one minute).
3. In this example, if the belt speed is 60 feet per minute; the volume output of this line in a minute would equal $\frac{1}{2}$ cu feet of mix x 60 = 30 cubic feet or 1.11 cubic yards.

Checking CRF/ wetting agent addition rates -

- Check product label for target addition rate.
- Run mixing line and capture all the granular contents falling from the hopper.
- Continue to collect CRF or granular wetting agent in a dishpan or flat over a defined time (e.g. one minute).
- Weigh the total amount of granules collected.
- Calculate amount of additive supplied from hopper per unit volume of growing media. Example: assume amount of Osmocote® collected in one minute equals 6 pounds. Since the line makes 1.11 cubic yard of mix in that time, the measured addition rate = $6 \text{ lbs.} / 1.11 \text{ yard} = 5.4 \text{ lbs.}$
- If rate is off by more than 10% of target, adjust the hopper gate height or hopper belt speed and conduct another calibration until the measured rate is close to targeted rate.

Quality Check

- Aside from occasional calibrations, there is a CRF quality check that can assess the rate and uniformity of CRF application called prill counts.
- Pull several, one cup (237 ml) samples of media.
- Lay out each sample of a tray and pick out all Osmocote® prills in the sample.
- Count the number of prills removed from each sample and send data to your ICL Specialty Fertilizer representative.
- We can quickly use this data to calculate the actual CRF addition rate.
- Additionally significant variability in prill counts between samples could be due to uneven distribution of granules throughout the growing media.

Your ICL Territory Manager can be a great resource and another set of eyes as you set up your equipment. Please do not be afraid to ask for their assistance!

