

Are Surfactants Needed with HydraFiber® Blends: YES or NO?

Tips to Improve Substrate Wettability

This information was compiled by the HydraFiber team to answer your question “Do I need a surfactant or not?” and to provide you with tools to help with wettability in HydraFiber growing mixes.

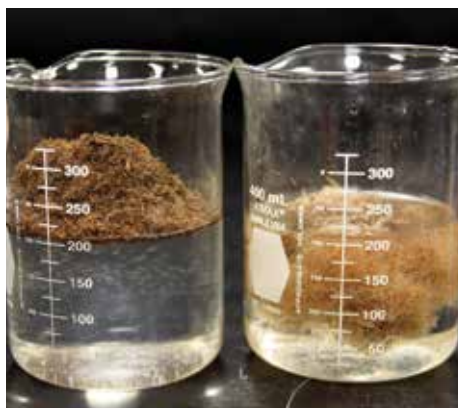
TIP 1

What factors influence wettability?

- Initial moisture of the substrate plays a huge role. Good moisture on the mixing line will prevent wettability issues in the pots. Both hydrophobicity of the raw material and the presence of a surfactant affect how easily the substrate wets up.
- Most growers are using peat-based or bark-based mixes. Both peat moss and bark have liability when it comes to wettability.
- **Peat** is naturally *hydrophobic* due to the structure of the peat fibers. It has a waxy cuticle layer on the fibers that repels water.
- **Bark** can become *hydrophobic* if saprophytic fungi are present. These fungi are naturally present in many substrate raw materials, particularly bark. They play a key role in the aging/composting process that makes the bark suitable for horticultural use. Fungal mycelium can be in higher quantities in bark that was not handled properly during aging/composting.
- Unlike peat and bark, **coir** is *hydrophilic* so it readily absorbs water.
- **HydraFiber** is also *hydrophilic* so it wets easily, compared to bark and peat.



WETTABILITY ISSUES WERE SEEN ON A GROWER VISIT IN BOTH HYDRAFIBER ON THE LEFT AND PEAT-PERLITE MIX ON THE RIGHT.



WETTABILITY LAB TEST: PEAT (10X VOLUMETRIC CONTENT OF HYDRAFIBER) AND HYDRAFIBER WERE ADDED TO WATER-FILLED BEAKERS. LEFT: ONLY 1% OF THE PEAT MOSS BECAME SUBMERGED (WET). RIGHT: ABOUT 98% OF HYDRAFIBER BECAME SUBMERGED.



WETTABILITY ISSUES WERE SEEN ON A GROWER VISIT IN THE PANSY ON THE LEFT, GROWN IN MIX WITH INCORRECT MOISTURE AT TIME OF BLENDING. THE PANSY ON THE RIGHT SHOWS NO WETTABILITY ISSUES.

TIP 2

Who should use a surfactant?

- Even though HydraFiber wets more easily than peat and bark, it makes up a minority part of the final blend. Therefore, mixes containing peat or bark as the majority component are the limiting factor in terms of wettability.
- *For all growers using HydraFiber at less than 50% in a bark or peat-based substrate, we recommend using a surfactant to avoid wettability issues.*
- *We do not recommend surfactants for those using coir-based mixes.*
- It is critical that a certain level of moisture is achieved in order for these peat and bark substrates to absorb and distribute water uniformly. Our recommendation is that bark should have approximately 55% to 60% moisture and peat should have around 60% to 65% moisture in order to wet uniformly without a surfactant.

TIP 3

Benefits of surfactants*

- Improves dry/wet cycles for all substrates (wetting and rewetting)
 - Can reduce spot watering
 - Greater wetting uniformity due to uniform water penetration and distribution
 - Better shelf life
 - Improves drainage
- * NOTE: Benefit information is compiled from manufacturers' surfactant information, not from claims by Profile Products.

TIP 4

How do I add surfactant?

- *We recommend adding surfactant at the time of blending.*
- If you have a wettability problem in the greenhouse with crops already in production, you can apply surfactant as a drench – initial moisture will play a huge role here. Substrates with low moisture content can be harder to wet even with a surfactant because initial watering can cause channels (paths) to develop. Once channels are established, subsequent irrigations – even with surfactants – may cause water to follow the initial path and dry pockets will continue to resist wetting. Several applications may be required to re-wet such a substrate. Some crops may be sensitive to drenches – always follow label rates and test a small sample first.

TIP 5

Types of surfactants

- **Liquid surfactants** can evenly distribute in the substrate and are economical; however, proper calibration into the mix line can be an issue and may lead to either over-applying or under-applying the wetting agent. *Incorporation rate is about 4 to 6 fl. oz./yard³*
- **Granular surfactants** are easy to blend on the line since you can put them through the chemical hopper, but are more expensive. *Incorporation rate is about 1lb./yard³*
Consult manufacturer label for incorporation rates.

TIP 6 *** Our most important tip ***

How do I develop a Quality Control program to test for moisture levels in my substrates?

There are three different tests that growers can use to test for moisture levels in their mixes. As a reminder, our recommendation is that bark should have approximately 55% to 60% moisture and peat should have around 60% to 65% moisture in order to wet uniformly without a surfactant.

MOISTURE SCALE:

This method is simple to use and very accurate, and is used to measure gravimetric water content of the mix; however, the equipment is costly.



MOISTURE SCALE

SQUEEZE TEST:

This method can be easily done on your mix line and the results are fast. However, training is needed for the squeeze test and there is more room for error.

- Pull a sample of soil from your mixing line belt that has been well-blended. With your fist, squeeze the soil and then release your fist. Observe what the ball of soil does.
- If the soil forms a tight ball or water drips during the squeeze, then the mix is most likely too wet (over 70% moisture).
- If the soil ball falls apart soon after releasing your fist, it is probably too dry.
- The optimal “squeeze” will show a ball of soil that holds its form somewhat, yet you can see it slowly expanding in the palm of your hand.
- Repeat the squeeze test several times and observe the results before making your decision. This particular test can be difficult to master because it is quite subjective and takes time getting accustomed to.



MIX THAT IS TOO WET:
WATER DRIPS DURING THE SQUEEZE



MIX THAT IS TOO WET:
SOIL FORMS A TIGHT BALL DURING THE SQUEEZE



MIX THAT IS TOO DRY:
SOIL BALL FALLS APART SHORTLY AFTER THE SQUEEZE



OPTIMAL MIX MOISTURE:
SOIL BALL HOLDS ITS FORM SOMEWHAT,
YET SLOWLY EXPANDS

FLOAT TEST:

This method requires readily available tools like a 50mL and 400mL beaker, a stopwatch and water. You can substitute these with a non-styrofoam cup, a shot glass and a phone stopwatch. The float test is inexpensive, non-subjective, quick and easy to do. It requires training and does not tell you if your substrate is too wet.

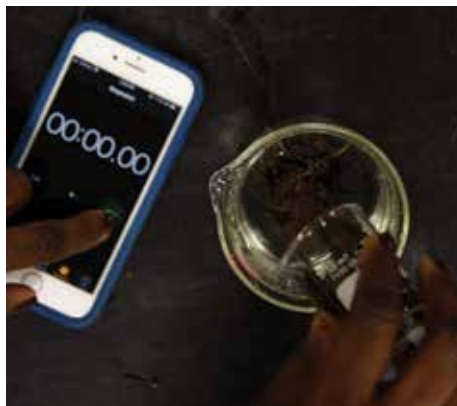
- Fill the 400mL beaker (or cup) with about 200mL (6.5 fl. oz.) of water and place it on a flat, solid surface. Loosely fill the 50mL beaker (or shot glass) with soil from your mixing line.

Then pour the soil out of the small cup into the larger cup, starting your stopwatch as soon as the soil hits the surface of the water. Once the media has submerged, stop the timer.

- Mix that is properly saturated should sink in approximately 30 seconds or less; however, mixes that sink in under 45 seconds are probably okay. Mixes that take more than 60 seconds to submerge are too dry.



FLOAT TEST USES READILY AVAILABLE MATERIALS



START THE TIMER WHEN SOIL HITS THE SURFACE OF
THE WATER



STOP THE TIMER WHEN SOIL IS SUBMERGED

SUMMARY

Your Wettability “Keys to Success”

- Manage moisture at blending and during production to avoid re-wettability issues.
- We recommend that anyone growing in peat and bark-based mixes use a surfactant.
- Adopt a QC test to assess substrate wettability in mix production.

NOTES

Questions?

Contact a HydraFiber expert
at 800-508-8681 today.