

FLAKE SOIL RECIPE by Kevin Nasser

Transcribed by Pedes and Pods discord user Raven. Typos may be present, spell check was not

This is not intended by any means to be taken as the only way or the best way to make flake soil. This is simply the method I currently use and have had great success with. You should use this as a guide to help get you started and adjust whatever you need to suit whatever species you keep.

What is Flake Soil?

Flake soil (FS) is a type of substrate used by both millipede and beetle keepers. To put it most simply, it is a fermented mixture of wood dust and either flour, wheat bran, chitosin, or soy flour. The use of a quality mycorrhizae inoculant aids in the fermentation process.

The purpose of allowing the wood dust to ferment is to break down the lignan structures and allow the animals to be able to consume the cellulose within. Without doing this, the animals will starve to death. Unfortunately this is a long process, it takes 6-8 months for FS to be ready. For this recipe I have adjusted this slightly in order to focus on making a high quality millipede substrate.

* It is highly important that the FS ferments and doesn't rot. This is ensured by daily turning for the first month. Weekly turning is sufficient for the rest of the process*

To get started making FS you'll need the following items:

1) **wood dust (saw dust):** most readily found near BBQ supplies. Wood pellets sold for smoking food with no additives in them can be used as the wood dust required to make FS. You simply put the pellets in a bucket and cover the pellets with hot water. The water will expand the pellets and leave you with a fine dust.

2) **Wheat bran:** As I said earlier, some use flour or other protein sources. I prefer wheat bran since, for me at least, it seems easier to get fermenting instead of rotting. I've spoken with others who have told me the opposite. Best advice I can give is to try experimenting with both and see which works better for you

3) **Mycorrhizae Inoculant:** Technically mycorrhiza is a symbiotic relationship between plants and fungi. For our use, a quality mycorrhizae inoculant (inoculum) puts beneficial fungi into our lignan and nutrient rich mixture and breaks it all down into something ready to be eaten by our hungry myriapods.

4) **Yeast:** I have used active yeast and brewers yeast. In my opinion, there is no discernable difference between either so use whichever you prefer. You do not need much

5) **Water:** Without moisture fermentation cannot occur

You want to follow a 4:1 ratio of wood dust to wheat bran. For example, 8kg wood dust : 2kg wheat bran. If you use too much wheat bran (or whatever additive you choose) the FS may be too "hot" and end up harming or even killing your millipede

Now that you have all your ingredients, lets get mixing. To keep things a little easier for those starting out, I'll continue explaining the process using my example from above.

Measure your 8kg wood dust and 2kg of wheat bran. Mix the dry ingredients together thoroughly. Now take a tablespoon of your mycorrhizae inoculant and mix it in with 20L of water. Add about 1/3 packet of yeast to the water, mix it all thoroughly, then pour it into your wood dust/wheat bran mix. Mix this all together THOROUGHLY. I cannot stress the mixing part enough. If it isn't all mixed together well enough, you can develop spots that rot instead of ferment and it will ruin your whole batch.

After you mix everything together well, cover it up and write down the date this batch was started. This will help you keep track of when it was started and allow you to make adjustments later on with your next batches.

Now it is absolutely crucial you turn the FS daily the first month. You do not want any area to become anaerobic (oxygen deprived) or else it will stagnate and rot which will ruin the whole batch. When you first start this you will notice the top layer of the FS will turn from a bright golden color to a dull light brown. This is exactly what you want to see. As you mix you'll see the lower layers will still have the brighter color. Eventually it'll all become uniform.

Another thing that you'll notice while mixing, the smell. The first and second month are the most intense. It is similar to the "skunky" beer or sour wine. This is perfectly normal. By the third month the smell will mostly have faded away. This is how you know your FS is doing well.

During the fermentation process the FS will generate its own heat. As long as wherever you're doing this doesn't get below 55F (12.7C) no supplemental heat is needed.

After the first month you only need to do weekly turnings (Although doing more is always better). When you do weekly turnings, you'll notice white cotton looking growths on the surface of the FS. That's mycelium and it's normal. It is a sign of healthy FS in the making. After 5 months this will no longer happen since the majority of the nutrients have been broken down.

By the 3rd month, I mix in dry dead leaf litter from various hardwood species as well as wood chunks that I can crumble easily in my hands. This will add more beneficial material that millipedes will greatly benefit from as well as ensuring that your substrate has lots of various trace elements as well that are required for healthy growth.

At the 6th month mark, your FS should look and smell like dirt. The color should have mostly lost all its bright goldenness and now resembles dark chocolate. If it doesn't quite have a rich earthy smell to it yet or it still looks a little light, don't fret. Just give it some more time.

This can be used as a complete substrate on its own, but before using it for millipedes I like to add more leaf litter, wood chunks, and a small amount of play sand (to help hold burrow better). Some others add sphagnum moss, but I see that as just a filler.

THINGS TO NOTE

- Too much water is a much bigger problem than too little water. If you are unsure of your measurements when starting this, lean on the side of caution and go with less water. You can always add more later on. If you start off with too much you're much more likely to cause your FS to rot
- If at any point the FS starts to smell like vinegar, ammonia, sulfur, or like a dead animal, it has started to rot and should be disposed of.
- The FS will continue fermenting long after the 8th month. You can dry it out to halt this and store for long term, or you can always use whatever is left over to start up new batches. Since the fungi and bacteria will already be accustomed to digesting the raw materials from the first batch, it should cut down some time of the subsequent batches made