

# Determining Log Moisture Content (LMC) and Establishing Check Logs



One step most growers omit during the inoculation process is the establishment of “check logs.” Though you can complete the following procedure at any time, it is most useful in the first growing season during spawn run.

“Too much work” is a very poor excuse for this rather simple but very important step. It’s time to sharpen up your pencil, put on your thinking cap and do some homework!

While inoculating logs, the “LMC Czar” must select at least 5 logs per 100 inoculated logs which represent a good sample of log diameters in the population. Make sure a check log is established for small, medium and large diameter logs.

Before the log is inoculated a disc is cut from it to determine the LMC. This disc is not cut haphazardly. With a chainsaw, cut off 6 inches from the end of the check log and toss it on the firewood pile. Then cut from the same end a disc about 1 inch thick. Weigh this piece as soon as possible, and record this information.

This is the “wet weight” (WW). Place the disc in a warm oven (175° F) with the door slightly ajar, and leave overnight. Weigh it again in the morning, then put it back in the oven for an additional hour and reweigh. If the disc has stopped losing weight, you have reached the “dry weight” (DW). Record this weight.

After the disc is cut from the log, weigh the remaining log to determine its fresh weight, and record this information. Staple an aluminum tag to the end of the log and identify it as a check log. Also, make sure the disc cut from this log is identified as such.

## Now For Some Math Homework

Let’s assume the wet weight of our sample disc weighed 4 oz. before you placed it in the oven, and after drying it, weighed 2.75 oz. This is the dry weight. You can now calculate LMC by using the following equation:

$$\frac{WW - DW}{WW} \times 100 = \%LMC$$

So, in our example:

$$\frac{4 - 2.75}{4} \times 100 = 31\% \text{ LMC}$$

This is the first step in a very useful management process.

The second step is a little more involved, and determines how much the wood in the log weighs.

This is the “Calculated Oven Dry Weight” (CODW). To find this, dig up the fresh weight of the sample log you recorded after cutting the sample disc.

Let’s assume the sample log weighed 15 lbs. Knowing this and the LMC determined from the disc, CODW is calculated as follows:

$$\text{Log Fresh Weight} - \frac{(\% \text{ LMC} \times \text{Log Fresh Weight})}{100} = \text{CODW}$$

Using our example:

$$15 - \frac{(31 \times 15)}{100} = 10.35 \text{ lbs.}$$

This is the weight of the wood in the log. The rest of it (4.65 lbs.) is water, which must be kept in the log to ensure proper spawn run.

Take the CODW (10.35 lbs. in this example) and write it on the aluminum tag stapled to the end of your check log. This information becomes the base line from which to measure LMC throughout spawn run. How well it is used by the grower determines success.

The important thing to remember is that spawn run is best above 35% LMC, and below this level, it slows down resulting in slower colonization and increased chances of competitor fungi becoming established.

Below 23% LMC, shiitake is dead! In the example above, 31% is on the dry side. Corrective measures should be taken, such as irrigation or soaking to increase the LMC.

How do you determine when you have reached 35% or more LMC? By weighing the check log after watering and doing some quick calculations.

Let's assume you took the check log and placed it into a tank of water for 48 hours. Upon removal you found it weighed 16.5 lbs. You can now determine % LMC by using the following equation:

$$\frac{(\text{Current Weight} - \text{CODW}) \times 100}{\text{Current Weight}} = \% \text{ LMC}$$

So, in our example:

$$\frac{(16.5 - 10.35) \times 100}{16.5} = 37.3\% \text{ LMC}$$

Right back where the LMC should be! This is a very powerful management tool and should be put to use no matter if you are doing 10 or 10,000 logs. The math may be scary, but with a few practice problems, it becomes so easy you will wonder why everyone doesn't do this.

## Labeling Logs

The final step is to label all your logs. Please do not neglect this step as it will only lead to self-condemnation at a later date. Though we have seen much innovation in this area, make sure your labeling is permanent and wildlife proof! Over the years wildlife, namely crows and turkeys have discovered the joy of removing aluminum tags from our logs. We now double label all our logs so in case of wildlife predation.

Aluminum tags are nice because they can be permanently embossed with a pen. On the label, place the strain and inoculation date. In this way there will never be any doubt about that log's history. Labeling is just the beginning of a good record keeping system, which any serious grower should develop, improve and customize as a valuable management tool.