

Increasing Dry Matter with Mycroliquid Supplement

F.H Parker and S.G Whitehall

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This experiment clearly demonstrates that Regular Mycroliquid premixed in the casing or Organic Mycroliquid “watered on” during case run in addition to regular supplement improves the yield by 3-4 kg/m² in optimum conditions.

More interestingly, this yield increase is coming from dry matter which is up between 14.3% and 17.9% over 3 flushes with Organic Mycroliquid. Mushrooms were visually observed to be whiter again with Organic Mycroliquid, though this was not measured.

Regular Mycroliquid was also observed to come in to 1st flush two days early and maintains that difference until the end of the crop.

The implications are that shelf life of mushrooms can be increased by 15% more than they currently are.

Introduction

This experiment is the 3rd trial to prove whether yield increases with Mycroliquid casing supplement are coming from more water or more dry matter in the mushrooms.

Also it is very apparent that our “in house” trials have consistently higher responses in yield and mushroom piece weight compared to commercial growers in the field and the evidence gained by making detailed comparisons has shown that there is a “check list” of factors that must be in place to ensure optimum responses over 2-3 kg/m². These factors were applied to this trial as well.

There are two scenarios for adding Mycroliquid supplement to the casing:

1. Premix in the casing 2-3 days before application (best) with Regular Mycroliquid
2. Water on the casing during case run; usually day 0 or day 1 with Organic Mycroliquid

Material and Methods

Phase 3 compost: Tunneltech Ltd. Casing McDon Peat. Spawn A15.

Compost was removed from blocks and mixed together to homogenise. Compost was measured out two 7kg lots and put into a plastic growing tub with appropriate treatment as below with replicate. Champfood compost supplement was applied at 1.5%. The following rates of Mycroliquid were applied in the casing.

Regular Mycroliquid 175ml diluted up to 1.3 l /m² (premixed 2 days before use)

Organic Mycroliquid 420ml diluted up to 1.3l /m² (premixed 2 days before use)

Organic Mycroliquid 420ml diluted up to 2.5 l /m² on day 0

Organic Mycroliquid 260ml diluted up to 2.5 l /m² on day 0

The compost was watered on top with 2.5 l/m² and lightly pressed and casing added to a depth of 50mm. Casing was divided into treatments above; either premixed in advance or watered on after the casing was applied.

Temperature in compost was controlled to 24-25C during the case run. After 4-5 days the plastic was removed and 2 waters of 2L/m² added to the casing whilst maintaining warm air temperature 22C. Airing was made on day 6.

Visual observations were made throughout the whole crop. Picked mushrooms are untrimmed weight. We estimate effect of this is approximately 10% inflation in yield figure compared to trimmed (Table 1). After weighing the mushrooms from each treatment, they were trimmed and prepared for drying in an oven at 90C for 14 hours. The weights before and after drying were used to calculate the dry matter % for each treatment and compared (Table 2).

The checklist for maximising yields (from previous trials) which we now recommend for growers are as follows:

1. Fill compost with at least 1% soya/organic gold compost supplement
2. Water at filling 2.5L/m² (or more if compost structure and conditions permit)
3. Check pH of casing above 7.2 (8 optimum)
4. Apply premixed supplemented casing to compost (Regular or Organic Mycroliquid) adding CAC **OR** apply normal CACed casing and then water on diluted Organic Mycroliquid in day 0 or day 1.
5. Apply micro perforated film on casing after supplement application for 3-4 days
6. Apply more water (if needed) after removal of film

Results

The tables are laid out as follows; the left hand column are by flush and flush totals. Along the top are the treatments which can be read off in top left hand side corner; compost supplement rate, product used, location of application and dosage rate. Numbers in black are yield (untrimmed); those in green are % increase in yield on controls.

Compost	1.5%	1.5%	1.5%	1.5%	1.5%
Casing	Nothing	Regular ML	Organic ML	Organic ML	Organic ML
Location		Mix In Casing	Mix in Casing	On Casing	On Casing
Treatment	0 ml	175ml	420ml	260ml	420ml
	Yield	Yield	Yield	Yield	Yield
1 st	12.2	15.6	15.4	15.9	17.6
2 nd	15.5	17.7	16.0	16.0	15.0
1 st & 2 nd	27.7	33.3	31.4	31.9	32.6
% increase	-	20.2	13.4	15.2	17.7
3 rd	7.0	10.1	8.3	7.0	7.2
Total (kg/m ²)	34.7	43.4	39.7	38.9	39.8
% increase	-	25.0	14.4	12.1	14.7
Cost / m ²	0.00	0.38	0.59	0.36	0.59

Table 1: Yield for Mycroliquid treatments in casing plus Soya supplement in compost

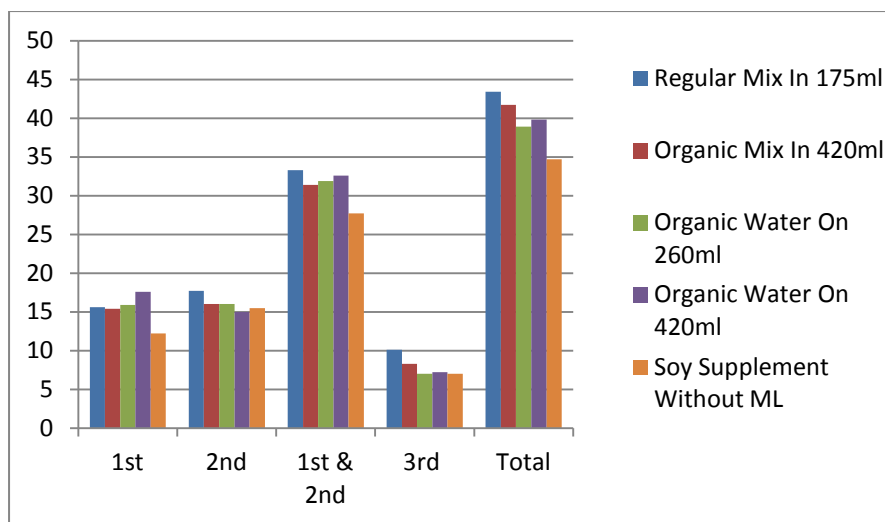


Figure 1: Yield for Mycroliiquid treatments in casing plus Soya supplement in compost

Compost Casing Location Treatment	1.5% Nothing	1.5% Regular ML Mix In Casing	1.5% Organic ML Mix in Casing	1.5% Organic ML On Casing	1.5% Organic ML On Casing
	0 ml	175ml	420ml	260ml	420ml
	% DM	% DM	% DM	% DM	% DM
1 st	8.6	7.8	8.3	7.9	missing
2 nd	8.0	6.3	8.4	8.9	9.3
3 rd	7.3	6.6	7.7	7.6	7.5
DM (kg/m ²)	2.8	3.0	3.3	3.2	-
% increase	-	7.1	17.9	14.3	-

Table 2: Dry Matter contents for Mycroliiquid treatments in casing plus Soya supplement in compost

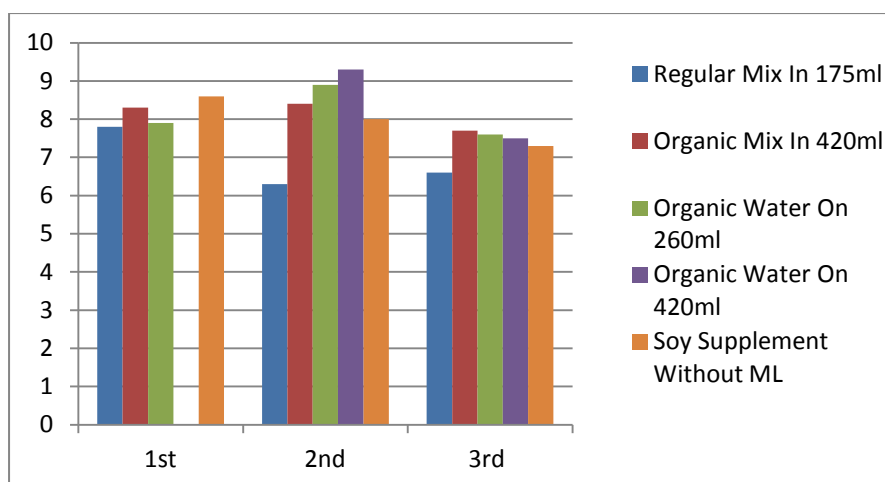


Figure 2: Dry Matter contents for Mycroliiquid treatments in casing plus Soya supplement in compost

This experiment clearly shows when using Mycroliquid that yield is increased by a minimum of 4.2 kg/m² on top of regular soya supplement alone. Regular Mycroliquid premixed in the casing 2 days prior to application has the highest additional yields of 20.2% in 2 and 25% in 3 flushes. Additional yield with Organic “water on” supplement at 260ml/m² of 15.2% in 2 flushes and 12.1% in 3 flushes.

Highest Dry matter yield increase is with Organic “water on” supplement (420ml) of 17.9% and 260ml of 14.3%. In terms of individual flushes the dry weights of mushrooms are higher for Organic “water on” supplement in both 2nd and 3rd flushes at both rates. It is important to read dry matter contents of each flush combined with yield figures to get the overall picture.

Yield response and dry matter increases between 260ml/m² and 460ml/m² with Organic “water on” supplement are close, so using a lower rate would make commercial sense.

Another observation seen with Regular Mycroliquid premixed in the casing speeded up the crop allowing 1st flush to be picked two days earlier than everything else and this was maintained until the end of the crop.

Discussion

What is most interesting in this trial is the increase in dry matter content of the mushrooms in each flush when Mycroliquid is used. It is obvious from the results that the yield increases are coming from higher dry matter contents. The highest being 17.9% when premixed, but still very respectable 14.3% with simpler watering on technique.

It is hypothesised that if dry matter in the mushrooms is up by these values that it almost has a direct relation with shelf life (Prakash et al). Also higher dry matter in the mushrooms causes increases in cap firmness of fresh picked mushrooms and those after 7 days storage and also a reduction in loss of weight and loss of colour (Loon et al), so we can say that shelf life is also increased by 15%.

Mushrooms with Organic “water on” treatments were observed to have whiter mushrooms visually, although this was not measured by any instrumentation.

IMPORTANT NOTE ON USE OF PLASTIC

It is important to emphasize the importance of plastic in these trials and the massive effect it has on the end results.

There is much published mushroom research about how the Agaricus mushroom produces growth hormones to stimulate mycelium growth and other substances that help it to fight off competitors. These are prevalent during warm temperature phases eg case running and would normally be lost quickly to the air stream as they are produced and percolate out of the compost and casing layer. It is hypothesised that using plastic, especially at the beginning of the case run could help to trap and possibly enhance the levels of these substances short term.

We understand about the practicality of plastic and the concern that growers have with getting enough water in the casing layer and the time to do it. Based on experiences in numerous commercial farms, we know that it is possible, it just needs a change in thinking.

The effect of putting plastic on the casing stops the evaporation process and loss of water from the casing, so firstly there is not the same need to add as much water as normal. Secondly, when we put plastic on at the beginning of the case run for 3-4 days, the casing, compost and interface all come to a similar temperature optimum for mycelium growth. We believe that in many commercial situations CAC is damaged or

compromised from the outset by too much water too quickly and too soon. With plastic the opposite happens and this CAC is encouraged to 'feed' off the Mycro products as is the mycelium coming in from the compost.

Interestingly, the stopping of the evaporative process also controls the compost temperatures at a steady level and you do not 'see' the overheating that you might expect.

So based on adding a certain amount of water to the compost and casing on day 0, placing plastic on for 3-4 days and then continuing to water, but to a lower level than previously as normally done, you can arrive at the airing stage with as much water as normal, and better fed mycelium, which ultimately turns into mushroom dry weight and quality yield.

References

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Appendix

Plastic being used practically on commercial shelf and tray farms

