



# Mushroom production

27. Makongo

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## Introduction:

An experiment was conducted to investigate convenient and improved techniques of edible mushroom growing substrates.

Rice straw (T1), maize husks (T2) sawdust (T3) maize husks mixed with sawdust ratio 3:1 (T4) and sawdust mixed with maize husks ratio 3:1 (T5) were used as treatments/substrates in this experiment. Mushroom was sown on these substrates then incubated for growth of the mushrooms. Harvesting of mushroom began at an average of 19 days after spawning. Results of the experiment showed that there were significant differences of the substrates performance ( $P \leq 0.05$ ) at different intervals of harvesting.

The means harvesting per treatment were 453g for T1 as a control, 187g for T2, 235g for T3, 239g for T4 and 245g for T5. In evaluation of different substrates as growing media for mushroom T5 which was a substrate with a mixture of sawdust ratio 3:1 show economical production of mushrooms through using it a substrate. Further research is required for evaluation of different substrates as growing media for mushroom so as to be able to recommend the best substrate under environment with minimized contaminations.



## Treatments

In this experiment there were five mushroom growing substrates. The first substrate was rice straw as a control, the second was maize husks, the third was sawdust, the fourth was maize husk and sawdust mixed in 3:1 ratio, and the fifth was mixture of sawdust and maize husk mixed in 3:1. *Pleurotus spp* (Oyster mushroom) was spawned on each of these substrates. In summary the treatments were as follows:

**T1** = Rice straw

**T2** = Maize husks

**T3** = Sawdust

**T4** = Maize husks and sawdust in ratio of 3:1

**T5** = Sawdust and maize husks in ratio of 3:1

Maize husks, and sawdust were collected from Dar es salaam, rice straw were collected from coast region.

Spawn was collected from UDSM

## Spawning (sowing mushroom)

Double layer spawning method was used in sowing the mushrooms. The spawn was scattered on half filled bag followed by substrate then near the top up the second spawn layer was inoculated, the bags was then filled completely and tied by thread. Using a sharp needle, six holes were made on each of the polyethylene bags for aeration so as to reduce concentration of carbon dioxide in it.



Spawning	Spawn day	Open day	Pin head formation	First harvest
1 <sup>st</sup> spawning	08 Aug 12	18 Aug 12	23 Aug 12	26 Aug 12
	08 Aug 12	22 Aug 12	26 Aug 12	28 Aug 12

Table 2 shows yield data of mushrooms as they were harvested in relation with substrate on which they were grown. There was a significant difference among the substrates in which the *pleurotus spp* mushroom was spawned. Also different substrates have different length of time from spawning to harvesting (Table 1).

Treatment	Dark Room	Dark room to 1 <sup>st</sup> harvest	1 <sup>st</sup> harvest to 2 <sup>nd</sup> harvest	2 <sup>nd</sup> harvest to 3 <sup>rd</sup> harvest	3 <sup>rd</sup> harvest to 4 <sup>th</sup> harvest	4 <sup>th</sup> harvest to 5 <sup>th</sup> harvest	Dark room to 5 <sup>th</sup> harvest	Spawning to last harvest in g	YIELD BLOCK	RICE STRAW CONTROL (GM)	MAIZE HUSK (GM)	SAWDUST (GM)	MIXTURE OF SAWDUST AND MAIZE HUSK (GM)	MIXTURE OF SAWDUST AND MAIZE HUSK (GM)	TOTAL HARVEST
T1	10	07	05	09	10	09	40	49	A	420	150	280	350	240	
T2	10	08	06	10	-	-	24	34	B	530	110	410	200	280	
T3	15	11	05	08	10	11	45	60	C	640	240	300	60	360	
T4	13	07	06	05	10	-	28	41	D	380	260	280	421	100	
T5	13	09	06	12	06	08	41	54	E	450	100	350	455	100	
									F	410	-	100	300	50	
									G	550	200	205	250	450	
									H	400	-	120	110	320	
									I	300	-	50	97	350	
									J	450	250	250	150	200	
									TOTAL	4530	1310	2345	2393	2450	13028
									MEAN	453	187.1429	234.5	239.3	245	1358.9429
									SD	97.073855	67.25927	114.9505	139.1363	131.3393	
									PERCENTAGE						

The above data record the yield of *pleurotus* mushroom in gram units, grown in mushroom house with different substrate. The purpose of the experiment (special project) was to test the effects of the different substrate in *pleurotus spp* production as measured by yield. The spawn was randomly assigned to one of five (5) treatment groups.

## The harvest

Data for the harvest as in Table 3 showed that rice straw was best substrate with yield of 453g which was significantly better than all other substrates ( $P \leq 0.05$ ). Lowest yield was harvested when maize husks were the substrate. But this was not significant by different from the rest of the substrates except rice straw ( $P \leq 0.05$ ). Note that some of maize husk (T2) substrate and mixture of maize husk and sawdust ratio 3:1 (T4) were highly affected by Black mould and hence were removed from the mushroom house.

## Conclusions:

In evaluation of different substrates as growing media for mushrooms, the sawdust, the mixture of sawdust and maize husks showed better performance than the other treatments but it could not be as good as rice straw which was the control. It has also experienced in this experiment that contamination of substrate with mould and dryness were an important problem.

## Recommendation

Hygienic in the mushroom production area should be adhered in order to reduce losses and adequate moisture to reduce dryness. Scientific and economical ways should be used in combination of art to design and to run all activities involved in mushroom for reducing contamination and creating conducive environment for mushroom production.

Further research is required for evaluation of different substrates as growing media for mushroom so as to be able to recommend the best substrate in a given environment with minimized contaminations,

## References:

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## Further information:

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