INFLUENCE OF FOUR SPAWN RATES ON HK35 *PLEUROTUS* MUSHROOM YIELD AND DAYS TO PRODUCTION

INFLUENȚA A PATRU NORME DE MICELIU UTILIZATE LA ÎNSĂMÂNȚARE ASUPRA PRODUCȚIEI ȚI A DURATEI CICLULUI DE PRODUCȚIE

PRICOPE MARIA [1], STAN N.[2]
[1]Direcția Sanitară Veterinară şi pentru Siguranța Alimentelor, Neamț
[2]Universitatea De Ştiințe Agricole şi Medicină Veterinară, Iaşi

Abstract. *Growers have thought, in the past, to optimize the amount of spawn used to inoculate their substrate. Increasing the amount of spawn used (up to 2 percent of the wet weight of the substrate) has resulted in increased yields. Increasing spawn rates from 0,5 percent substrate wet weight to 2 percent may result in yield increases of nearly 50 percent. Yield increases may be due to the following factors: the increased level of nutrient available in higher levels of spawn used and more inoculum points.*

By using a spawn rate of 2 percent of the wet substrate weight, it is possible to reduce the time to production by more than 7 days compared to a spawn rate of 0,5 percent. Thus, growers could complete the crop cycle faster, minimizing the exposure of the production substrate to pest infestations (ex. Lycoriella mali).

MATERIAL AND METHODS

Spawn produced in Hungary was used for experimenting on the hybrid HK 35. The producer recommends the spawn level of 1 kg for 100 kg substrate.

The substrate used was made of 50% shreded wheat straw and 50% ground corn cobs which, after homogenizing, were pasteurized using the hydrothermical method and then the substrate was inoculated with different spawn rates, having as a result the following variants: V_1 - 0,5% spawn, V_2 - 1% spawn, V_3 - 1,5% spawn şi V_4 - 2% spawn.

The influence of the quantity of inoculated spawn on the mushroom yield, the time length of production cycle and the economic efficiency was observed.

RESULTS AND DISCUSSIONS

As one can see in *Table 1* and *Figure 1*, the yield increased from 18,1 kg/100 kg substrate (V_1 – control) up to 27,5 kg/100 kg substrate by increasing the spawn level at inoculation.

Table 1.

Influence of spawn level used for inoculation of the nutritious substrate on the yield

Variant	Average yield		Difference of yield (kg/100 kg substrate)	Significance
	Kg/100 kg substrate	%		
V_1 - 0,5% spawn (control)	18,1	100		
V_2 - 1% spawn	25,9	143,1	+3,13	x
V_3 - 1,5% spawn	26,3	145,3	+4,74	xx
V_4 - 2% spawn	27,5	151,9	+7,61	xxx

DL 5% - 2,88
DL 1% - 4,36
DL 0,1% - 7

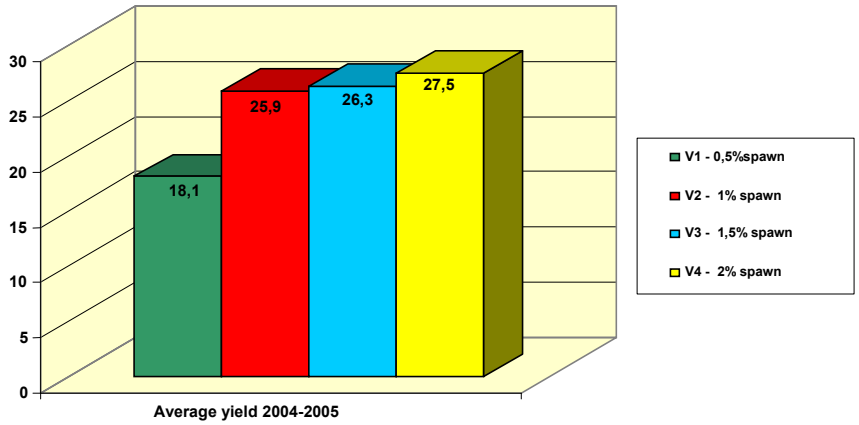

Fig. 1. Influence of spawn level used for the inoculation of the nutritious substrateon the yield

In the case of variant 2, for which the spawn level used was the one recommended by the producer - 1%, the average yield obtained was of 25,9 kg for 100 kg substrate, a significant increase of 3,13 kg for 100 kg substrate in comparison to the control variant being recorded.

In the case of variant 3, a yield of 25,9 kg/100 kg substrate was recorded, the difference of 4,74 kg in production in comparison to the control variant being a distinct significant one, and in the case of variant 4, for which the spawn level used was doubled to the one recommended (2% comparing to 1%), the yield recorded was the highest, 27,5 kg/100 kg substrate, having a difference in comparison to the control variant of 7,61 kg, a very significant one.

As regarding the influence of the spawn level on the time length of the production cycle, it came out that by using a spawn level of 2% of the wet substrate weight it is possible to reduce the production time with more than 7 days, in comparison to a level of 0,5% spawn. Thus, the growing cycle can be completed faster, minimizing the exposure time of the growing substrate to the infestation with different pests.

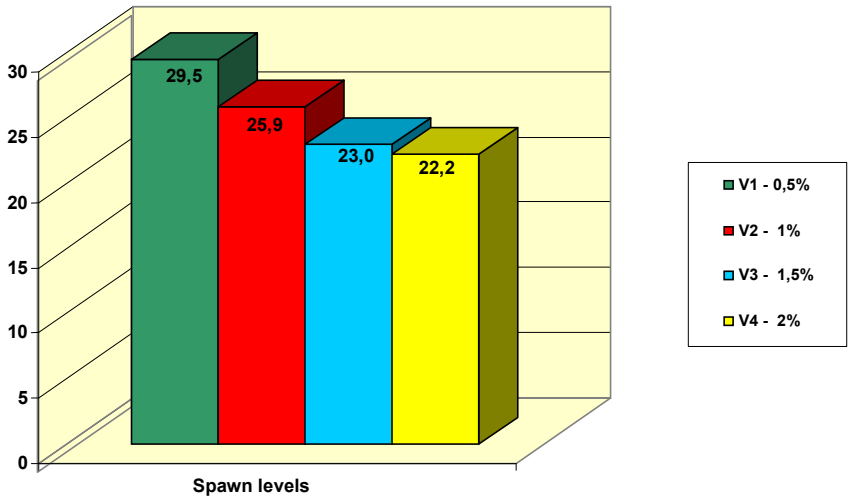

Fig. 2. Influence of spawn levels on the time length of the production cycle

Therefore, in the case of using some increased spawn levels, a negative correlation between the spawn level and the number of the production days is noticed. The higher the spawn level is, the lower the number of the production days is. (*Fig. 2*).

Research proved that the flies or the mosquitoes of the mushrooms (*Sciara fenestralis sin. Lycoriella mali*) can complete their life cycle in 25 days at 21°C whereas at a temperature of 18°C the life cycle can be ended between 35 and 38 days. A shorter growing cycle helps to minimizing the infestation level of a mushroom farm with different populations of insects.

From our own research, we noticed that a level of 1% spawn of the wet substrate weight is justified, in an economic point of view, by the yields obtained, and the time length of the growing cycle allows, in this case, the evacuation of the degraded substrate in time, thus the massive infestations with different pests being avoided. (*Tab. 2, Fig. 3*).

Table 2.

Costs and incomes obtained depending on the spawn level used at inoculation

Variant	Production (kg/100kg substrate)	Costs for spawn Euro/100 kg substrate	Incomes Euro/100 kg substrate
V_1 - 0,5 % spawn	18,1	2	32,0
V_2 - 1 % spawn	25,9	4	45,8
V_3 - 1,5 % spawn	26,3	6	46,5
V_4 - 2 % spawn	27,5	8	48,6

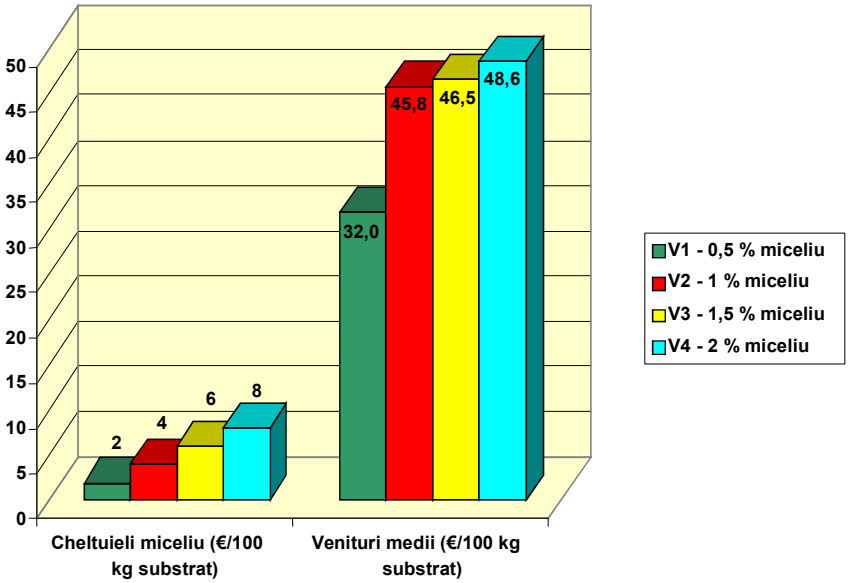

Fig. 3. Costs and incomes obtained depending on the spawn level used at inoculation

CONCLUSIONS

1. Using a spawn level of 1% led to the obtaining of high average yields (25,9%), the costs recorded being of 4 euro/100 kg substrate;

2. In the case of using a spawn level of 1,5%, the average yield obtained increased to 26,3 kg mushrooms for 100 kg substrate, the costs getting to 6 euro/100 kg substrate;

3. When the spawn level was doubled, the average yield recorded was of 27,5 kg mushrooms for 100 kg substrate (the increase being of only 1,6%), whereas the costs for the spawn/100 kg substrate doubled.

REFERENCES

1. **Chilom Pelaghia,** 2005 - *Cultura ciupercilor Pleurotus*, Edit. Sitech, Craiova.
2. **Mateescu N.,** 1996 – *Cultura ciupercilor Pleurotus*, studiu complet, Revista Idei de afaceri, Editura Rentrop.
3. **Royse D.J.,** 2002 – *Influence of spawn rate and commercial delayed release nutrient level on Pleurotus (oyster mushroom) yield, size and time to production*, Appl. Microbiol. Biotechnol. 58: 527-531.
4. **Stan N., Munteanu N., Stan T.,** 2003 - *Legumicultură*, vol III, Editura Ion Ionescu de la Brad, Iaşi.