International Journal of Horticulture, 2026, Vol.16, No.5, 331-337
http://hortherbpublisher.com/index.php/ijh

Research Report Open Access

Effect of Different Spawn Rates on the Growth, Yield, and Economics of Oyster Mushroom (*Pleurotus ostreatus*) Cultivation in Bardiya, Nepal

Bipin Koirala [1] ✉, Aakriti Gautam [1], Shiva Chaudhary [2], Kamal Budha [2]
1 Agriculture and Forestry University, Rampur, Chitwan, 44209, Nepal
2 Shree Janata Secondary School, Bardiya, 21808, Nepal
✉ Corresponding author: iambipin500@gmail.com
International Journal of Horticulture, 2026, Vol.16, No.5 doi: 10.5376/ijh.2026.16.0028
Received: 28 Jul., 2026
Accepted: 22 Sep., 2026
Published: 19 Oct., 2026
Copyright © 2026 Koirala et al., This is an open access article published under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.
Preferred citation for this article:
Koirala B., Gautam A., Chaudhary S., and Budha K., 2026, Effect of different spawn rates on the growth, yield, and economics of oyster mushroom (*Pleurotus ostreatus*) cultivation in Bardiya, Nepal, International Journal of Horticulture, 16(5): 331-337 (doi: 10.5376/ijh.2026.16.0028)

Abstract Spawn rate is an important management decision in oyster mushroom (*Pleurotus ostreatus*) cultivation, shaping colonization speed, contamination risk, yield, and profitability. Most Nepalese growers nonetheless follow a traditional 10% rate (one 200 g spawn packet per 2 kg dry paddy straw) that reflects packet sizing and habit rather than local evidence. To test this convention, a pot-bag trial was conducted in Bansgadhi, Bardiya, using a Completely Randomized Design with five spawn rates 4%, 6%, 8%, 10% (farmer practice), and 12% each replicated four times. Increasing spawn rate progressively shortened the spawn run from 24.5 days (4%) to 15.9 days (12%), with pinhead initiation and first harvest following suit. Yield and biological efficiency rose with spawn rate up to 10% (468 g/bag; 23.4%) before plateauing at 12% (472 g/bag; 23.6%), while cap diameter and stipe length declined as fruiting-body density increased; contamination fell sharply above 6%. However, once spawn cost was weighed against returns, the 8% rate gave the highest benefit-cost ratio (1.34), ahead of the 10% standard (1.30). An 8% spawn rate is therefore recommended as the more economical choice for smallholder growers in Bardiya and similar Terai districts, while 10%-12% remains preferable where speed and maximum yield outweigh input cost.

Keywords Oyster mushroom (*Pleurotus ostreatus*); Spawn rate; Biological efficiency; Benefit-cost ratio; Bardiya, Nepal

1 Introduction

Oyster mushroom (*Pleurotus ostreatus*) is among the most widely grown mushroom species in Nepal, owing to its short cropping cycle, modest capital requirement, tolerance of a broad temperature range, and its ability to convert lignocellulosic residues such as paddy straw into a nutritious, marketable food (Pokhrel, 2016). National mushroom production has grown roughly eight-fold over the past decade, from about 1,530 t in 2010/11 to about 12,607 t in 2019/20 (MoALD data cited in Sapkota et al., 2022), and the crop is now recognized as one of the more accessible entry points into commercial horticulture for landless and smallholder households (Raut, 2019). Its cultivation has spread quickly among smallholder and landless farmers across the Terai, including Bardiya district one of Lumbini Province's major rice-producing districts, with roughly 77,500 ha under paddy cultivation and an annual paddy output of about 310,600 t (MoALD, 2023) where the resulting paddy straw is abundant right after the main rice harvest and mushroom growing offers a short-duration source of household income through the winter months (Poudel and Bajracharya, 2017).

Spawn is the vegetative seed material through which mycelium is introduced into the substrate, and the spawn rate the proportion of spawn to substrate on a weight basis is one of the most influential, and most cost-sensitive, decisions a grower makes. A higher spawn rate generally speeds up mycelial colonization and narrows the window during which competing molds and bacteria can get a foothold, but it also raises the direct cost of production, since spawn is typically the single most expensive input after labour (Bhandari et al., 2022). An insufficient spawn rate, on the other hand, can prolong colonization, increase contamination losses, and delay cropping cutting into both yield and profit at the same time.

In Bardiya and comparable Terai districts, a spawn rate of about 10% mixing one 200 g spawn packet with roughly 2 kg of dry paddy straw is commonly used in local commercial practice. The rationale behind this specific