


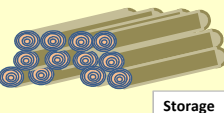
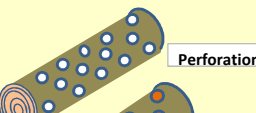
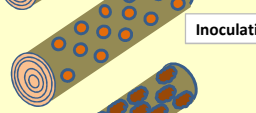

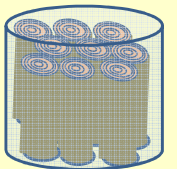
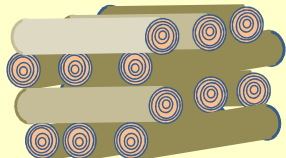
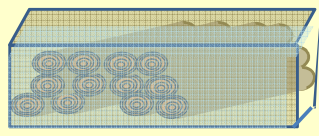
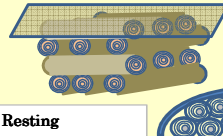
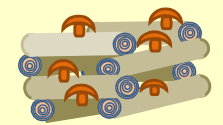
## Shiitake bed-log cultivation flowchart

### Middle land

Thimphu 2,310 m

Paro 2,406 m

	Nov.			Dec.			Jan.			Feb.			Mar.			Apr.			May			Jun.			Jul.			Aug.			Sep.			Oct.		
	early	middle	late	early	middle	late	early	middle	late	early	middle	late	early	middle	late	early	middle	late	early	middle	late	early	middle	late	early	middle	late	early	middle	late	early	middle	late	early	middle	late
Rain fall mm	1.8			4.0			6.9			11.3			18.4			29.7			53.0			97.1			144.0			123.6			81.0			47.5		
Max. temp. °C	18.0			15.1			14.1			15.7			18.7			21.6			23.8			25.7			26.3			26.2			24.8			22.1		
Min. temp. °C	4.2			0.5			-0.5			1.6			4.7			8.3			11.8			14.9			16.5			16.3			14.6			9.7		
Relative hum. %	67.3			69.9			72.0			67.1			65.4			64.8			67.1			70.4			77.0			76.5			75.7			70.5		

Production process	Log cutting			Inoculation			Pre-incubation			Main incubation												Soaking/Harvesting					
																											
Working contents	<ul style="list-style-type: none"> <li>Cutting</li> <li>Cutting to size, transporting</li> <li>Sorting by log diameter, storage</li> </ul>			<ul style="list-style-type: none"> <li>Drilling of holes</li> <li>Inoculation</li> <li>Waxing (sealing)</li> </ul>			<ul style="list-style-type: none"> <li>Pre-incubation</li> <li>Small-diameter log: (cover with plastic sheet)</li> <li>Intermediate-diameter log: (cross-stack or stand on ends with space in between)</li> <li>Large-diameter log: (incubation (cross-stack or stand on ends with space in between))</li> </ul>			<ul style="list-style-type: none"> <li>Remove cover --&gt; incubation (cross-stack or stand on ends with spacing in between)</li> <li>Soaking, fruiting: harvest</li> <li>Resting</li> </ul>												<ul style="list-style-type: none"> <li>Soaking, fruiting: harvest</li> <li>Soaking, fruiting: harvest</li> </ul>					
Shiitake mycellia	Culture and storage of seed fungus						Logs colonized by shiitake mycellia			Spread and maturation of mycellia												Stimuli to induce fruiting (watering, temperature, light) growth of primordia			Fruiting body formation, phototropism, nutrient uptake		
Important points & diseases	<ul style="list-style-type: none"> <li>When cutting logs, do not use logs infected with <i>Hypoxylon</i> spp.</li> <li>After cutting, if the log surface becomes too hot (through exposure to direct sunlight, etc.), spores of harmful fungi will germinate; thus, keep logs in the shade and avoid high temperatures.</li> <li>Be careful not to damage the bark.</li> </ul>			<ul style="list-style-type: none"> <li>Be extremely careful when inoculating with spawn.</li> <li>Check that spawn is not contaminated.</li> <li>Scrape the spawn surface using a sterilized implement and discard the scrapings.</li> <li>Perform inoculation and waxing under sterile conditions.</li> <li>A log moisture content of 38 to 42% (wet base) is suitable for inoculation.</li> </ul>			<ul style="list-style-type: none"> <li>The purpose of pre-incubation is to allow the spawn to colonize the logs.</li> <li>Allow shiitake mycellia to spread to the inner bark near the inoculation hole by maintaining temperature and humidity.</li> <li>Watch carefully for contamination by the harmful fungi listed to the right.</li> </ul>			<ul style="list-style-type: none"> <li>Characteristics of harmful fungi</li> <li><i>Hypoxylon</i> spp. on log ends: Ascospores germinate at high temperatures due to plastic sheet, etc. Reduce temperatures by removing plastic sheet, etc. Avoid drying under bark layer.</li> <li><i>Tricoderma</i> spp. on log ends: Young colonies will die if dried. Early treatment is important.</li> <li><i>Diatrype</i> and <i>Graphostroma</i> spp. on bark surface: Occur in high temperature environments (due to direct sunlight, etc.) in the spring. Avoid high temperatures by providing shade.</li> <li><i>Schizophora</i> and <i>Merulius</i> spp. on bark surface and log ends: Fungi of both genres germinate and grow under excessive moisture and can be spread through bark to bark contact.</li> </ul>												<ul style="list-style-type: none"> <li>Soak in water that is 20°C or lower for 8 to 10 hours.</li> <li>In August or September, do not perform steam treatment after soaking. In fall and winter, perform steam treatment within 2 days of soaking. After steam treatment, cross-stack the logs or stand the logs on their ends and cover the upper surface.</li> <li>Harvest before the caps open too much. If they are left open for too long, they can be infected by harmful fungi or damaged by insects.</li> </ul>			<ul style="list-style-type: none"> <li>For resting, leave the logs cross-stacked for approximately 40 days.</li> <li>During the resting period, occasionally water so that the logs do not become too dry.</li> </ul>		