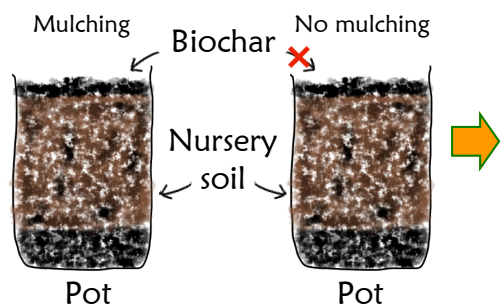


Soil heating test using rice husk biochar mulching

3



Biochar mulch : 44.0°C

No biochar mulch : 24.4°C

Tested at 11:00AM, 17 April, 2020, Thimphu.

Soil heating effectiveness is enhanced by biochar mulching. The effectiveness depends on exposure time, cropping season and nursery location.



Biochar is a multi purpose item, mulching, soil renovation, moisture conservation, mixing material for nursery soil, pH adjuster and so on. But be careful not to over use. It is an alkaline material as soil pH adjuster.



མི་རྒྱུ་ཞིབ་འཇུག་དང་གོང་འཕེལ་ཁྲུང་། བོད་ཐང་། དབང་འདུས་མོ་བྲང་།
Agriculture Research and Development Center
Bajo Wangdue Phodrang
Department of Agriculture, Ministry of Agriculture and Forests



Sample of mulching. Many possible uses.

4



Biochar and plastic cap.



Biochar with plastic mulch.



Black plastic mulch.



Rice husk mulch for nursery.



Rice straw mulch for nursery.



Let's imagine how to prevent drying up of the nursery bed and planting bed using mulching.

Vegetable cultivation Theme 3 Mulching

Step-up Guide

Contact: Arjun K. Ghallay, Duptho Wangmo,
Tshering Dema, Karma Dema, Tashi Dorji
RNR-RDC Bajo, Department of Agriculture, MoAF
Bajo, Wangduephodrang, Bhutan
Phone: +975-02-481260, 481209
E-mail: akghallay@moaf.gov.bt
dupthow@moaf.gov.bt, tsheringddema@gmail.com
karmadema97@yahoo.com, tashidorji2@moaf.gov.bt



Integrated Horticulture Promotion Project
2016-2021



Introduction

1

Technique of mulching includes multiple benefits such as 1) to **enhance warming up or keeping soil temperature**, 2) to **control undesirable weeds** and 3) to **keep moisture in surface soil**. Additionally, organic mulching materials provide 4) **supplement materials for soil structure & character renovation**. Plastic mulching materials will bring a reliable effect in increasing soil temperature rise. In each mulching materials, there are merits and demerits when used as a mulches. So, the materials should be selected properly according to your circumstances.

Unfortunate sample



Despite high irrigation frequency, the surface soil became hard and dry with cracks. This nursery bed had difficulty to absorb water evenly without extra management. Mulching can prevent such surface soil condition, keep better moisture from physical damages of daily watering and strong sunlight.

Related information is available.










Biochar

Mulching materials

2

There are several types of mulching materials as listed below. Please choose and use the materials according to your purpose, your belief and your way of thinking.

Materials	Common usage	Cautionary points
 Clear plastic sheet	Heating nursery bed (The most effective heating)	1. No natural decomposition. 2. Not possible to control weeds. 3. Heat damage to seeds and roots.
 Black plastic sheet	1. Heating planting bed 2. Keeping moisture 3. Thorough weed control	No natural decomposition.
 Black with Silver back plastic sheet	Silver side (use in summer) 1. Aphids control 2. Weed control 3. Cooling soil	1. No natural decomposition. 2. Limited dealers in town. 3. Silver side can be used in summer only.
 Biochar	1. Keeping moisture 2. Heating soil 3. Supplement minerals 4. Organic input	Self production required.
 Straw/rice husk	1. Keeping moisture 2. Organic input 3. Keeping soil temperature constant	Difficult to obtain in some areas.
 Dried weed	1. Keeping moisture 2. Organic input 3. Keeping soil temperature constant	Contamination by weed seeds
 Wood chip	1. Keeping moisture 2. Organic input	1. Growth inhibition by some substances from cedar tree (phytoncide). 2. Wood chip is acidic (pH 4-5). 3. Decomposition in soil takes 6 months to 1 year.