



Utility of a Decision Support System for Mushrooms

Dr. Yogesh Gautam, Principal Scientist
ICAR-Directorate of Mushroom Research, Solan (HP)

Introduction

Indian farmers believe that mushroom comes only in temperate, cool climate and lack knowledge about mushrooms and its cultivation practices. Few who are familiarized with mushroom cultivation, grows mushroom only during winter season. This seasonal cultivation is restricted to one mushroom species i.e., button mushroom. Button mushroom cultivation is more risky and needs huge initial investment compared to tropical mushroom cultivation. Besides this, extensive cultivation of one mushroom species invites more pest and diseases. Because of these reasons, mushroom cultivation in India is very sparse, scattered and clustered around some small pockets of the country. This necessitates us for diversification of mushrooms according to the seasons in a year for better mushroom production.

Across India, choice of mushroom by farmers is not appropriate to the prevailing climatic conditions. Though India falls under tropical climate, the proportion of tropical mushroom production is too small compared to temperate button mushroom production. This is due to less awareness of mushroom diversity among farmers and extension functionaries. The different edible mushrooms require specific environmental requirements that make choice of mushroom as a difficult task for common farmers. Hence, it is necessary to provide a decision support system in an easily understandable way to choose mushroom for total Indian geography.

Diverse geographical conditions and varying climatic conditions in India provides immense scope for cultivation of different mushrooms. Huge agricultural wastes (> 600 m tones annually) from farming sector are additional advantages. Exploitation of seasonal variation for year round cultivation of different edible mushroom has great scope. But in India, this concept is almost missing and few farmers in India adopt round the year cultivation of mushrooms. In this line, development of suitable models for round the year mushroom cultivation is needed besides its popularization.



Importance

Indian agriculture produces about more than 600m tones of residue. This huge organic resource causes considerable environmental pollution and it is essential to recycle or utilize these organic wastes in amicable way. Mushroom farming has great scope in this line as it grows on organic wastes. In this way, mushroom cultivation reduces pollution by waste reduction.

Farmers get more return from the invested capital as he gets additional mushroom production from the farm waste. In addition his burden on disposal of residue is avoided. In this way farmer can reduce cost of cultivation simultaneously increasing income.

Seasonal cultivation utilizes the labour less effectively, involves high risk and depends on one mushroom species alone. Round the year has relatively less risk as it includes many mushroom species in different seasons of the year. It effectively utilizes farm residues, labour and invested capital. It does not require any additional land for its production.

In India, mushrooms are produced less than its real potential. With little more agricultural waste production, China is producing 15 times higher than the Indian mushroom production (FAO, 2006). Sufficient attention and proper measure towards mushroom cultivation boosts its production level many fold which boosts the economy of farmers as well as nation.

The mushroom cultivation solves unemployment slightly by generating additional employments. This helps mostly the landless labourers and low income peoples.

Mushroom diet is considered as a quality food as it contains enough protein, minerals, low fat, no cholesterol besides its medicinal properties. It helps to reduce the shortage of vegetable demands in market as it is cultivated from residues in non-arable lands. Quality food in general improves the nutritional status of farming community. As a whole, mushroom farming improves the socioeconomic status of the poor peoples and farmers.

The DSS developed for round the year cultivation of mushroom and its popularization augments mushroom cultivation in all over India. Thus this proposed project has more



important in the point of food shortage, increasing environmental pollution and improvement of socio-economy of poor peoples in the society.

Methodology adopted

This DSS covers entire India. For this purpose, Indian districts details was used as database in VB.net environment. The weather data on air temperature and humidity collected from IMD, Pune and from this district level database on weather generated.

The choice criteria for cultivation of different edible mushrooms was developed by consulting experts as well as referring research literature besides correlating the field data available. These criteria requirements for different mushrooms correlated with established climatic database for suitable mushroom choice for particular time for each district in India. Similarly one year weather data was correlated and the apt mushroom choices for round the year were obtained. This programme was coded in VB.net software to get the desired spatial and temporal output.

Final output obtained validated on sample basis through all the coordinating centres of the All India coordinated Research Programme on Mushroom, few trainees and entrepreneurs. Considering non-uniformity of climatic conditions within the district, special provision was given for direct entry of climatic data as an input for mushroom choice by the users themselves. This enhanced the wider applicability of this DSS for different users in ease.

Conclusion

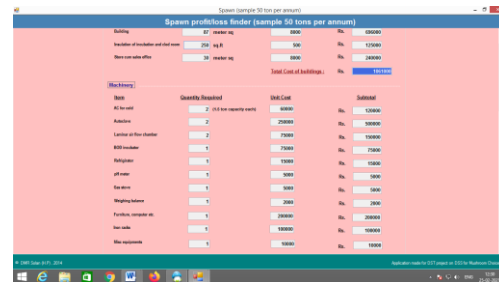
Development of such a Decision Support System was the need of the day which could guide the mushroom farmers of different parts of the country as to which mushroom to grow at which time of the year. The report is available state wise, zone wise and for the entire country. The DSS provides information on the wild mushrooms collected from different parts of the country. It also includes a profitability calculator which gives a user the cost benefit ratio on input of the various ingredients. In addition to this, the DSS gives information regarding various aspects of mushroom cultivation. It has a compost formulate which calculated the nitrogen percentage

of the compost on input of all the ingredients. The DSS would definitely be very helpful for mushroom growing aspirants who want to grow mushrooms throughout the year.

Some screen shots of the DSS:



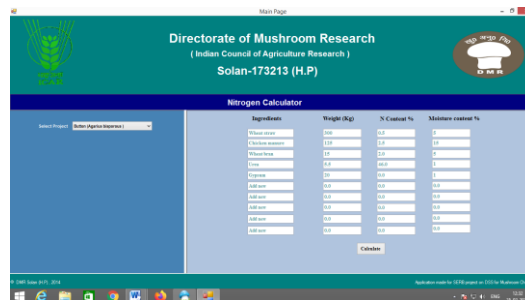
Database of wild mushrooms



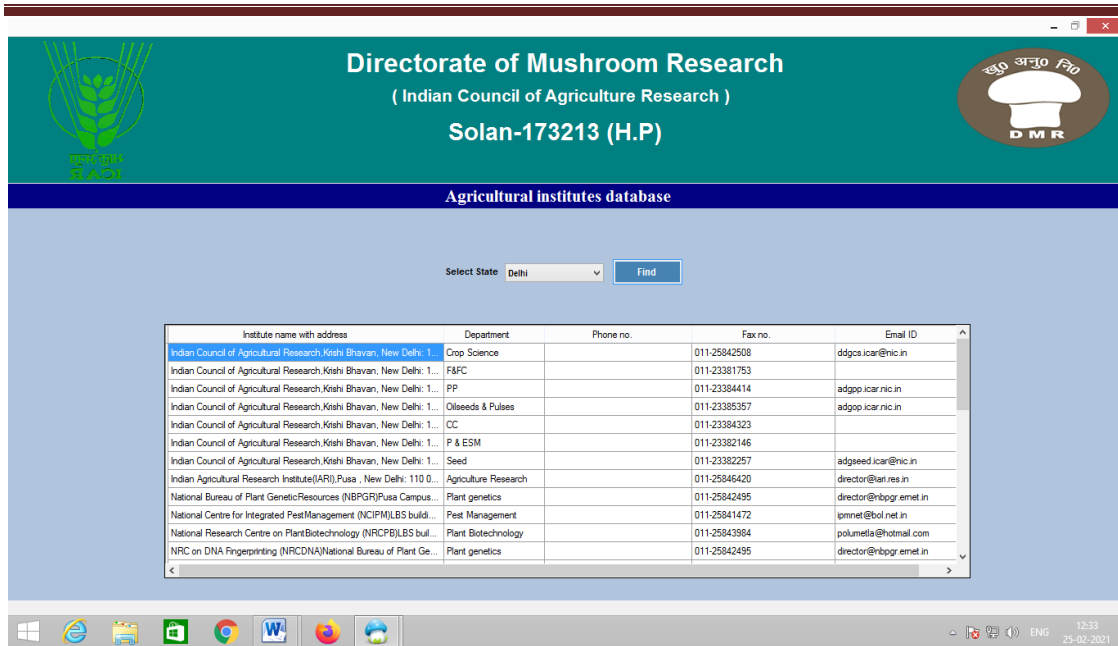
Profitability calculator



Know about mushroom cultivation



Formulate Compost



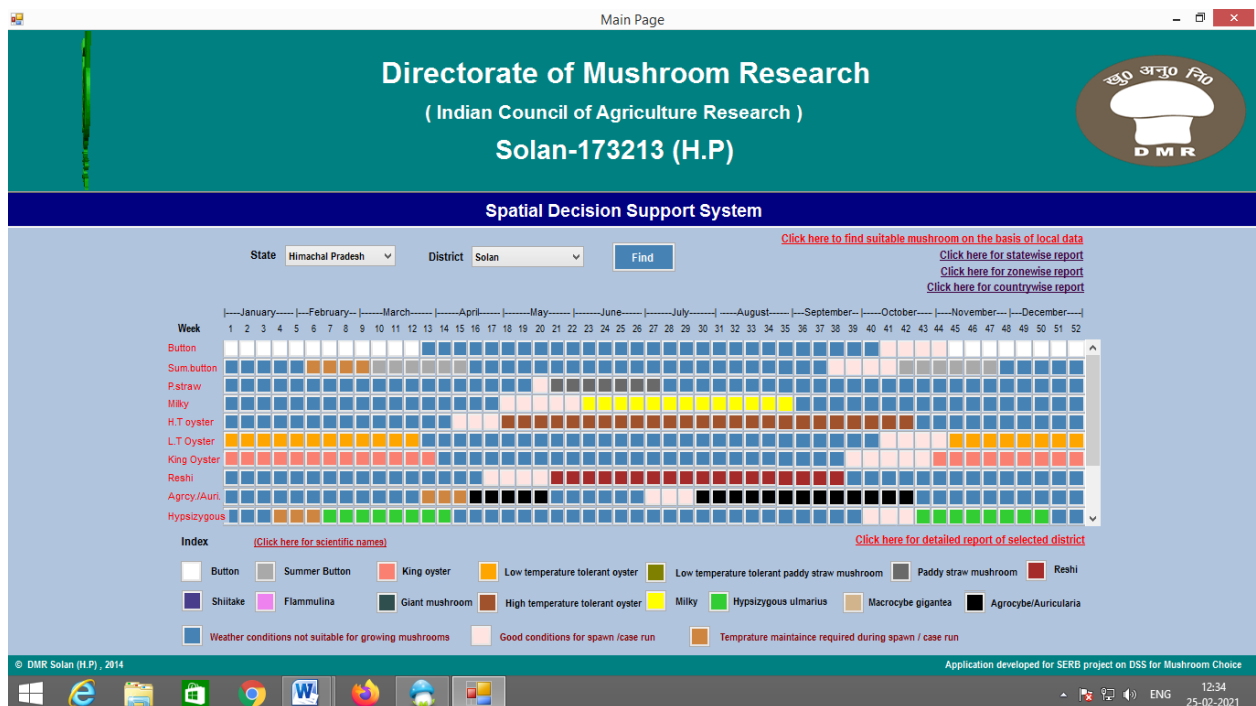
Directorate of Mushroom Research
(Indian Council of Agriculture Research)
Solun-173213 (H.P)

Agricultural institutes database

Select State:

Institute name with address	Department	Phone no.	Fax no.	Email ID
Indian Council of Agricultural Research,Kishi Bhavan, New Delhi: 1...	Crop Science		011-25842508	ddgos.icar@nic.in
Indian Council of Agricultural Research,Kishi Bhavan, New Delhi: 1...	F&FC		011-23381753	
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National Research Centre on Plant Biotechnology (NRCPB),LBS buil...	Plant Biotechnology		011-25843984	polumella@hotmail.com
NRC on DNA Fingerprinting (NRCDNA),National Bureau of Plant Ge...	Plant genetics		011-25842495	director@nbgr.ernet.in

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Directorate of Mushroom Research
(Indian Council of Agriculture Research)
Solun-173213 (H.P)

Spatial Decision Support System

State: District:

[Click here to find suitable mushroom on the basis of local data](#)
[Click here for statewide report](#)
[Click here for zonewise report](#)
[Click here for countrywise report](#)

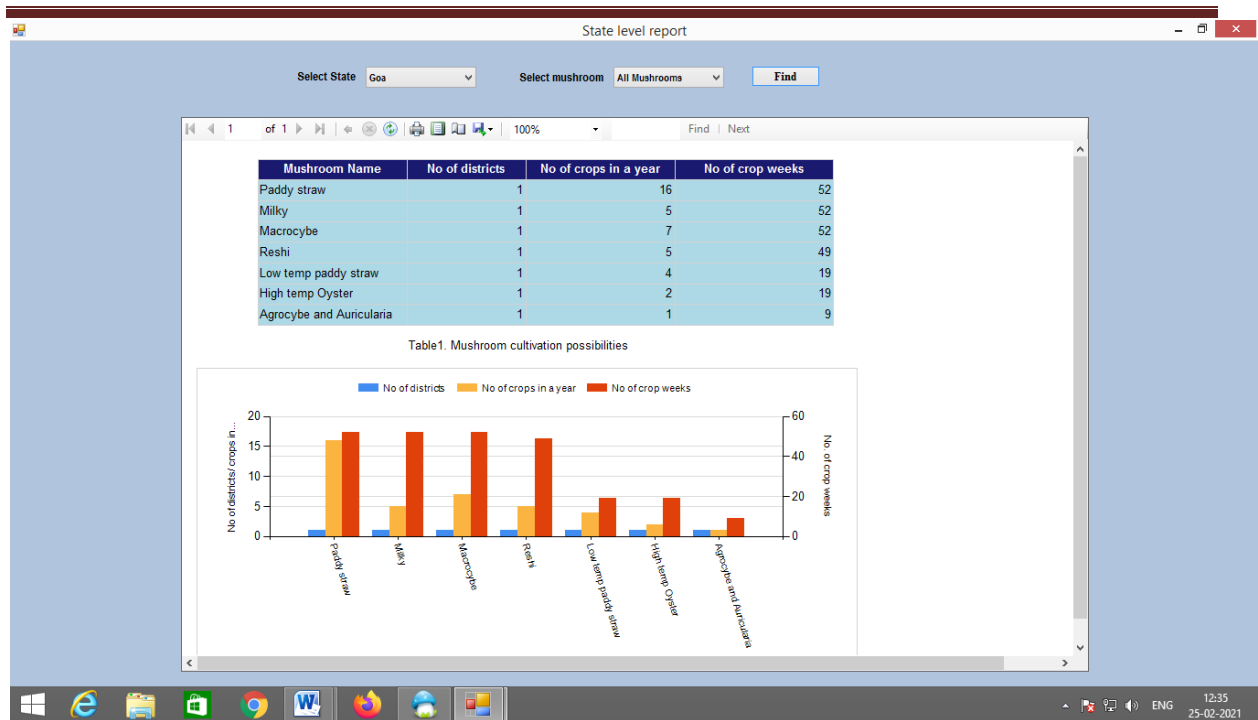
Week: January to December

Buttons: Button, Summer Button, King oyster, Low temperature tolerant oyster, Low temperature tolerant paddy straw mushroom, Paddy straw mushroom, Reshi, Shitake, Flammulina, Giant mushroom, High temperature tolerant oyster, Milky, Hypsizygous ulmaria, Macrocybe gigantea, Agrocybe/Auricularia

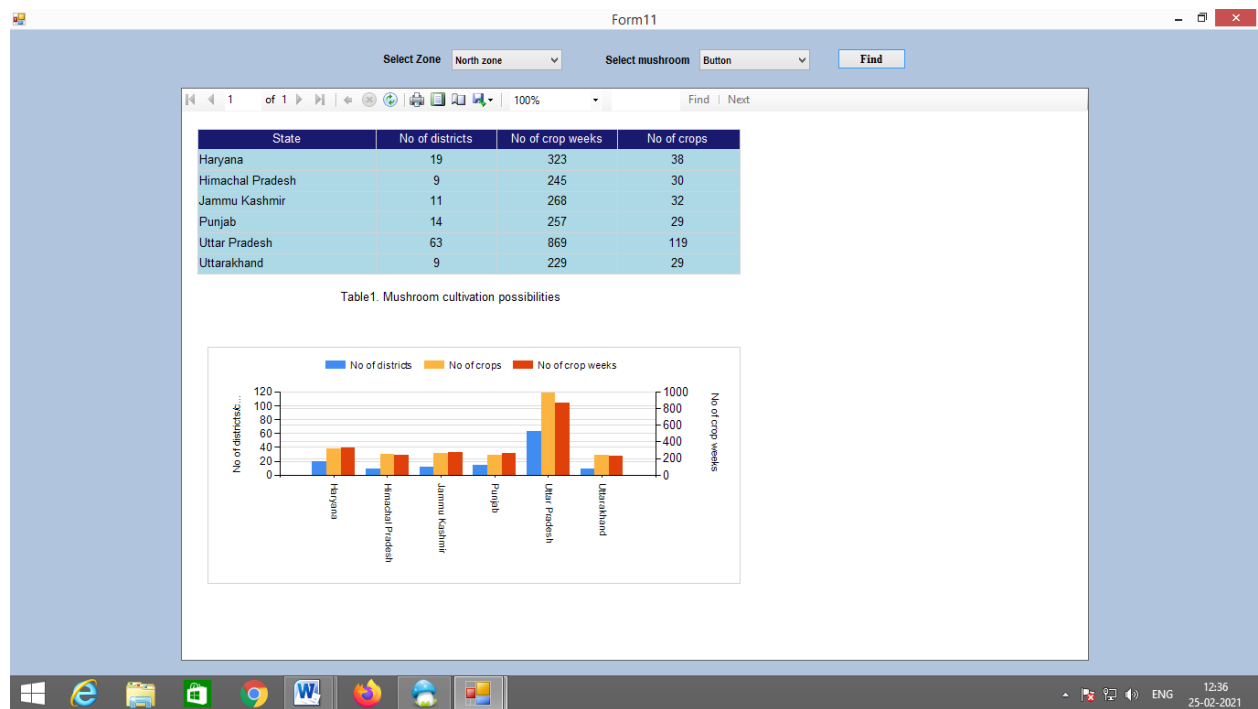
Legend: Weather conditions not suitable for growing mushrooms, Good conditions for spawn /case run, Temperature maintenance required during spawn / case run

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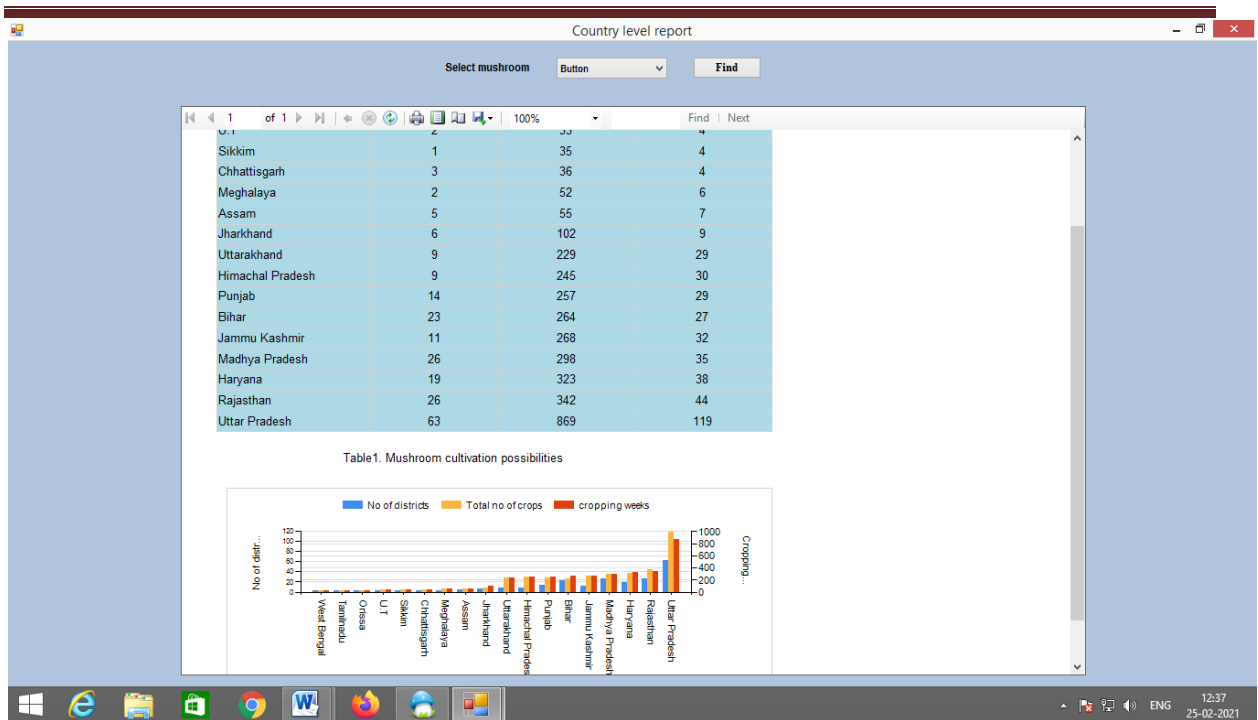
Choose Mushrooms for your region



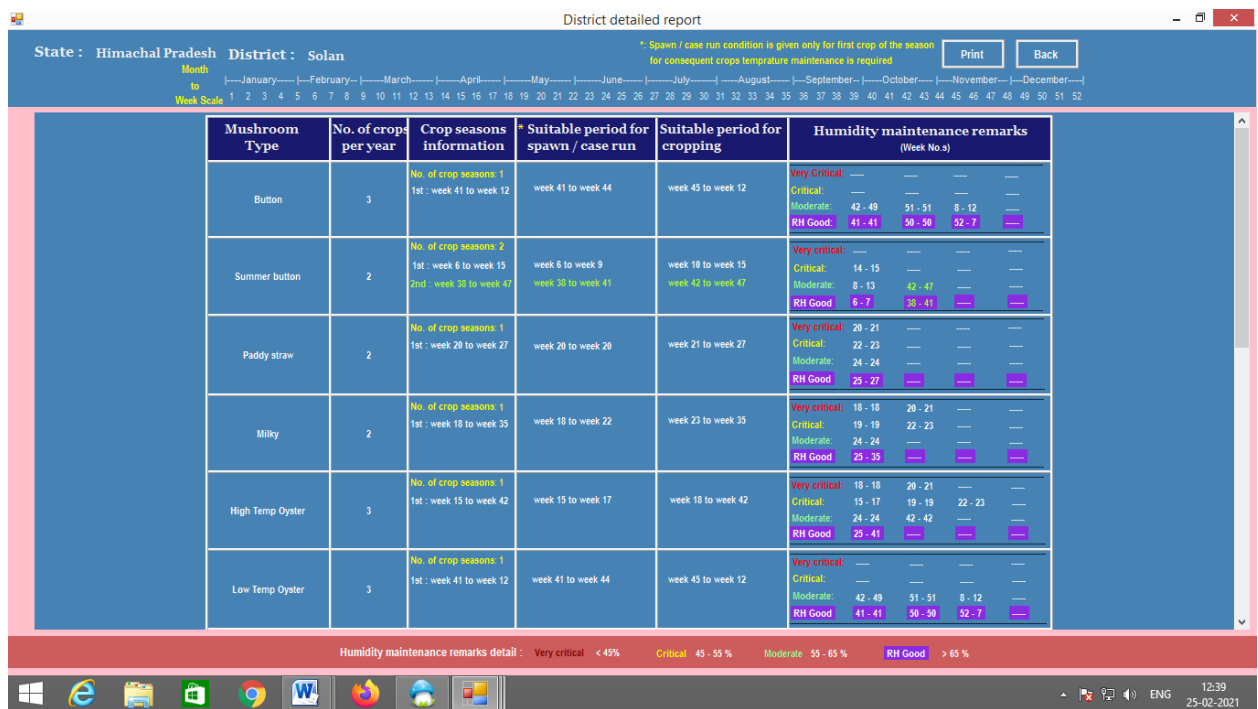
State wise report



Zone wise report



Country level report



Detailed report of a District of India