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ADAPTIVE RESEARCH ON SHIITAKE MUSHROOM CULTIVATION AS
A REPLACEMENT FOR OPIUM POPPY IN NORTHERN THAILAND

BY

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EDIBLE MUSHROOM CULTIVATION IN THAILAND

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F O R E W O R D

This is the semi-annual report for Contract Project No. 53-32R6-2-121 established between United States Department of Agriculture (USDA) and Thailand Institute of Scientific and Technological Research (TISTR). The project is also part of the main project initiated by TISTR namely Project No. 8. 23-18 "Edible Mushroom Cultivation in Thailand". The works reported hereafter cover the period from August 1982 to February 1983.

ADAPTIVE RESEARCH ON SHIITAKE MUSHROOM CULTIVATION AS A
REPLACEMENT FOR OPIUM POPPY IN NORTHERN THAILAND

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SUMMARY

Work on the development and adaptive research of shiitake mushroom cultivation have been carried out by TISTR in the highlands of Northern Thailand. Physical facilities and laboratory to obtain materials and supplies were partly furnished at the sites. Training sessions and extension works were held at eleven locations in the highlands.

INTRODUCTION

There has always been a great need of finding other crops to substitute the opium poppy grown illegally up in the high mountain areas of Northern Thailand. Temperate fruit crops, coffee, vegetables and shiitake mushroom have been introduced. It was observed that the mushroom cultivation showed a high return in a small space with less care and much shorter time than the others. However, special attention and control, especially of the product quality and marketing problems of fresh or dried forms of mushroom, are required for the first and after the second year of cultivation. The field co-ordinators are, therefore, needed to manage the mushroom cultivation and assist in eliminating the above - mentioned problems. The mushroom demonstration centers are also recommended for different areas which are far apart.

The research project on shiitake and button mushrooms as replacement crops for the opium poppy in Northern Thailand was thus initiated at TISTR in 1974 by co-operating with the Royal Project. The work funds were supported by the government and also foreign aid agencies such as

* Fermentation Technology Laboratory, Thailand Institute of Scientific and Technological Research.

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USDA. (Contract No. 12-14-0605-5). In 1981, the funds were provided by H.M. the King to construct two shiitake mushroom demonstration centers at Ban Pang Bong, Doi Saket District and Ban Teen Tok, San Kamphaeng District, Chiang Mai Province. The research and extension works on the mushroom cultivation are still further developed. In fiscal year 1982, besides a fund of 210,000 baht from TISTR which is quite limited to maintain or expand the adaptive research on mushroom cultivation, 1.8 million baht had been provided from the Secretariate Office of the Coordinating Committee for the Royal Patronage Development and Welfare Programmes, and also 10,000 U.S. dollars from USDA to fulfil the work. The construction of the mushroom spawn production plant at Doi Pui experiment station owned by Kasetsart University was then put through at the same year.

WORK PLAN

Works, in general, will be conducted in order to develop and extend the shiitake mushroom production in the highlands of Northern Thailand. The following tasks are usually carried out at the same sites and in the previous years at different requested areas:

- To furnish physical facilities and laboratory to obtain materials and supplies.
- To hold training sessions and to work with extension agents and farmers.
- To develop wood log-cutting methods.
- To develop packing methods and procedures.
- To develop mushroom drying techniques.
- To evaluate the acceptability of shiitake mushroom cultivation by farmers.
- To prepare extension-type publications and training aids.

WORK PROGRESS

The following works have been done concerning the adaptive research on shiitake mushroom cultivation:

1. Physical facilities and laboratory to obtain materials and supplies were partly furnished at the following demonstration centers:

- a) Ban Pang Bong, Doi Saket District.
- b) Ban Teen Tok, San Kamphaeng District, and at the spawn producing unit.
- c) Doi Pui, Experimental station.

2. Training sessions including extension works were held at the following areas:

2.1 Chiang Mai Province:

- a) Ban Pa Miang, Doi Saket District.
- b) Ban Huey Kaew, San Kamphaeng District.
- c) Ban Pangkhum, Samoeng District.
- d) Forest workers, Mon Angket Forestry Station, Mae Taeng District.
- e) Forestry Station, Doi Phahom Pok, Mae Ai District.

2.2 Royal Project Station:

- a) Ban Khun Klang, Chom Thong District.
- b) Ban Kae Noi, Chiang Dao District.
- c) Pang Qung, Khun Yuam District.
- d) Ban Fa Pae, Mae La Noi District.
- e) Mae Pun Luang, Phrao District.

2.3 Ban Mae Salong: Mae Chan District, Chiang Rai Province.

The works also include the spawn making at TISTR to be used for demonstration and films show during demonstrations such as: "How to grow shiitake mushroom" produced by colour T.V. Channel 7.

- "Growing temperate fruit crops" produced by the Royal Project.
- "Coffee growing" produced by the Royal Project.

- "Growing cut flowers" produced by the Royal Project.
- "His Majesty's Activity" from His Majesty Private collection.
- Entertainment movies.

Some typical pictures during the demonstrations at some of the areas or sites are shown in Figures 1, 2, 3 and 4. Inspections were made at each site once every month or two with advices and recommendation given (Figure 5).

3. Other works on wood log - cutting development, Koh tree growing, mushroom packing methods and drying techniques have also been carried out either at the sites or at TISTR.

DISCUSSION

The adaptive research works on mushroom cultivation have been carried out slowly due to various problems listed as follows:

1. Difficulty in communicating among the organizers, the demonstrators' experiences, the farmers and the market, due to distances and the rugged roads and trails in the highland areas especially in the rainy season (Figures 6, 7, 8, 9 and 10).

2. Changing of climatic conditions which causes low and inconsistent yield of the mushroom and thus leading to inconclusive result.

3. Lack of good co-operation among the farmers, the workers, the market and other related co-operation in order to obtain high quality mushrooms selling at reasonable price at the right time.

More works are to be investigated especially on demonstration and training of mushroom cultivation, marketing of the product and preparing extension-type publications and training aids.



Figure 1. Drilling the wood log during demonstration.



Figure 2. Inoculating the spawn under supervision.



Figure 3. Natural wood laying after inoculation.



Figure 4. Nursery for wood laying.



Figure 5. Inspection after a period of time.



Figure 6. Slash and burn cultivation (upland rice).



Figure 7. Road to Mon Ang Ket, Mae Taeng District.



Figure 8. Dangerous and slippery track.



Figure 9. Pushing against a back-sliding down the hill.



Figure 10. Climbing up a steep and slippery track by means of a winch.