

NPPO'S Assessment to Coffee Rust of Lalitpur District in the context of Organic Coffee

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Background

Lalitpur district covers 385 sq km within the 27°22' – 28°50' N and 85°14 - 85° 26 E. The district has two important physiographic features – river valley basin and hill region. The river valley basin below 1500 masl are located northern part of district. The hill region is above 1500 meters lies in southern part and covers about 211 sq km. About 45% of the total land is under cultivation in Lalitpur district.

The climate of the district ranges from subtropical in valley basin to temperate in hill region. The average maximum and minimum temperature are 23.6° C and 7.0° C. The district's average annual precipitation is 1,232 millimeters.

Growing of coffee was started from 32 years ago in Lalitpur district and coffee is the principal crop in the hilly region of Dhuladurlung, Gimdi, Aashrang and Pyutar areas of Lalitpur district. Nowadays, there are eight cooperatives; have been involving in the production of organic coffee. The produces have been selling in the European markets.

The farmers have become victims of devastating earthquake of 25th April 2015 and its aftershocks. From last two years, this crop has been infected by Coffee Leaf Rust (CLR). To investigate the situation, many concerned authorities – Nepal Agriculture Research Council (NARC), District Agriculture Development Office (DADO) and Tea and Coffee Development Section (TCDS) have visited and interacted to the farmers of affected areas. Plant Pathology Division of NARC has diagnosed that the disease is CLR and caused by *Hemileia vastatrix*.

To analyse further, NPPO has arranged a technical team. The team visited to the affected sites on 14th January, 2016. The team was comprised from, Regional Plant Protection Laboratory, Hariharbhavn; Plant Protection Directorate, Hariharbhavn and District Agriculture Development Office, Lalitpur. Additional

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team members were Mr Keshar Budha, JTA of Agriculture Service Centre, Gotikhel and Mr Mitharam Jamakatel, representative from Coffee Cooperative Private Limited, Lalitpur.

Methodology of Assessment

The team has visited to the affected sites of CLR of Dhuladurlung. Coffee growing farmers have been discussed and interacted through Focused Group Discussion. Finally, laboratory analysis of specimen will be diagnosed again in Plant Pathology Division of NARC, Khumaltar.



Technical team has been interacting with farmers



Technical team has been observing the coffee plants

Objectives of Visit

The team has following objectives while assessing CLR.

- To identify the existing scenario of coffee growing in Lalitpur district;
- To assess the incidence level of CLR;
- To identify the existing practices of farmers to manage the CLR;
- To provide the possible recommendations to manage CLR.

Existing Scenario of Coffee Production

Farmers have been growing Arabica coffee in Lalitpur district. The main botanical cultivars were found there – Bourbon, Pacamara, *Tekacia*. *Tekacia* is the name given by local farmers to the botanical cultivar of coffee and the technical team could not be confirmed its real name. *Tekacia* was grown dominantly; farmers have claimed that 90% orchard has been occupied by *Tekacia* variety. Incidence of CLR does not

differ among the cultivars although orchard of optimum moistured soil has relatively lower level of disease incidence.



Good moistured soil exhibits low incidence of CLR symptoms



Some coffee orchards have high severity incidence of CLR

In the fiscal year, the cooperatives have produced 20,745 kg dry parchment coffee. Table 1 is going to explain about list of cooperatives involved in the coffee production in Lalitpur district.

It is assumed that the CLR will decrease the yield of coffee by 30% in the forthcoming harvesting. Some farmers have frustrated with the disease problem and thinking to replace the coffee with other crops by destroying the coffee orchards.

Table 1: List of Coffee Cooperatives and their Production in Lalitpur District

S. N	Name of Cooperatives	Number of Farmers	Production of Parchment Coffee (kg)
1	Sagarmtha Coffee Producer Cooperative Ltd	72	3,376
2	Red Rose Organic Coffee producer Coop. Ltd	57	2,989
3	Durlung Jaibik Coffee producer Coop. Ltd	43	4,197
4	Lekali Organic Coffee producer Coop. Ltd	38	2,844
5	Uchha Pahadi Coffee producer Coop. Ltd	45	3,100
6	Gunastariya Coffee producer Coop. Ltd	42	123
7	Arabica Organic Coffee producer Coop. Ltd	34	3,533
8	Madhya Pahadi Coffee producer Coop. Ltd	35	587
Total		366	20,749

Incidence of CLR

The severity of incidence level seemed at moderate to high, varied from orchard to orchard and plant to plant. Farmers claimed that 60% of them have been spraying 1% solution of Bordeaux mixture. There

has not been seen difference about the infection of CLR among the plants with sprayed to non-sprayed. It has been found that none of the farmers have not been removing the infected and fallen leaves from their orchard; although orchard sanitation is crucial for management of CLR.



Moderate level of incidence of CLR



Moving towards high level of severity of incidence of CLR

Farmers' Practice

Most of the farmers have heard about the CLR and acquainted to the symptoms. Majority of the farmers have been spraying the solution of Bordeaux mixture. There was a thick layer of infected leaves on surface and farmers have not been clearing this. They have not been aware that fallen leaves are the sources of primary inoculum to attack new plants. When they were advised for clean cultivation, they were not willing and some of them told it is boredom job.

The technical team found further that there were few farmers, who have been growing 4-10 coffee plants in their homestead. These farmers have not been paying attention at least spraying of Bordeaux mixture to manage the CLR. This condition has been increasing the sources of inoculums of *Hemileia vastatrix* in the surroundings.

Shade management was poor in the coffee orchards. Some orchards were partially shaded and some orchards were low shaded. Training and pruning aspects were not also practiced properly, so that tree size and aeration was not optimum in the coffee orchards.



Poorly trained and pruned coffee plants



Poorly shaded coffee plants

Recommendations

Following points are advised to farmers to manage the coffee rust in the organic coffee production systems.

- Fallen leaves should be removed from the orchard and should be composted or destroyed.
- Spraying of 1% solution of Bordeaux mixture.
- Proper training of coffee seedlings should be carried out to ensure the adequate size for easy management as well as to encourage additional branching for maximum production.
- Timely pruning of coffee plants should be practiced to rejuvenate diseased and old trees.
- Internal quarantine practices should be strictly followed to prevent taking of coffee seedling in other areas.

Following points to be considered in policy/institutional level for sustainable management of coffee rust to support the system of organic coffee production.

- Awareness creation among the farmer communities about CLR should be carried out.
- Coffee rust specialist should be recruited to provide extension and advisory services to the farmers.
- Training and demonstration programs about CLR should be conducted extensively.
- Inputs required to manage the CLR should be provided to farmers on subsidized rate.
- Resistant cultivars to CLR should be screened through participatory research by collaborating with NARC, PPD, RPPL and farmer communities.