

Production and Marketing Constraints of Banana Enterprise in Nawalparasi District: Strategies for Research and Development

Tek P. Gotame*¹, Jagananath Adhikari² and Man B. Chetri³

ABSTRACT

A study was undertaken to assess the technological gap, farmer's knowledge on crop husbandry and production and marketing constraints on banana enterprise in Nawalparasi district during June to July 2004. This study has involved a combination of methodologies such as in-situ observation, key informant survey, focus group discussion, Participatory Rural Appraisal and Rapid Market Appraisal conducted by multidisciplinary team and secondary data were used. The motive force behind farmers to shift from a predominantly maize based cropping system into cash generating banana enterprise was due to lack of irrigation facility. However, an overwhelming constraint to the development and expansion of commercial production for this enterprise is extreme marketing problem. The awareness of growers about constraints on marketing has been realized. The technological gap between the research and farmer's knowledge were also felt directly. The orchard size ranges from one Kattha to 2.5 Bighas (339 sq meters to 1.7 ha) of land and orchard age ranges from recently established to 10 years old with ratoon cropping system. Plant population ranges from 1800 to 2400 per ha. It was found that most of the farmers have adequately applied nitrogen and phosphorus but potash was far below the recommended dose. Small farmers having less than two Katthas (660 sq meters) of orchard size faced acute marketing problem than commercial farmers. It was realized that there has a paradox situation of plenty with scarcity in production and supply system. The peak period of production has heavily concentrated from December to March, when there has been very low market price at all the market centers. Analysis on low fruit quality and production, and objective tree to solve marketing problems has been discussed.

Key words: Fruit Quality, Banana, Research Strategies, Problem Tree

BACKGROUND

Banana is a crop of tropical origin and cultivated throughout the tropical and warm areas of subtropical region of the world. In Nepal, it is widely cultivated in terai and foothills upto 1500 m above sea level (Gautam and Dhakal, 1993). Agriculture Perspective Plan (1995) has identified banana as an important high value commodity for both hill and terai that has been endorsed in the tenth five-year plan of Government of Nepal (GoN). The productive area under banana cultivation in Nepal is 4,406 ha with an annual production of over 48,005 t (APSD, 2002). Commercial cultivation of banana has started in some of the terai, inner terai, river basin, foothills and hill district of the country. Basrai Dwarf, Harichal and William Hybrid are the important commercial cultivars recommended for cultivation (ACD, 2001). Jhapali Malbhog is one of the Cavendish types of banana phenologically

¹ Scientist, Horticulture Research Division, Khumaltar. Email: tpgotame123@hotmail.com

² Soil Specialist, Fruit Development Directorate, Kirtipur

³ Plant Protection Specialist, Regional Training Centre, Khairanitar, Tanahu

resembling to Harichal and popularly grown in Nawalparasi, Chitwan, Jhapa, Morang and Sunsari Districts (Gautam and Gautam, 2002).

Nawalparasi district, located in the central terai region has high potentials for commercial banana production. It occupies three topographical regions: mid mountains, siwalik and terai. Commercial banana cultivation has emerged as a major income generation enterprises. The area under commercial banana cultivation in the district is about 650 ha with the average productivity of 15 t/ha (ABTRACO, 2004). This generated a total of NRs. 80, 00,000 for the growers. Shivmandir, Kawashoti, Prasawni, Naya Belhani and Narayani VDCs of the district are recognized as pocket areas for banana production where Jhapali Malbhog is the major dominating cultivar (ABTRACO, 2004). Moreover, a tremendous increase in area under banana cultivation has been reported at Kawashoti, Siva Mandir and highway corridor of the district (ABTRACO, 2004). Farmers have organized into producers groups to make easy access with external services available from service providers. However, farmers have come up with various unsolved problems. Lack of market and market information, producers are deprived of getting reasonable returns on one hand and consumers suffers from regular supply due to seasonal glutting of banana production. Similarly, other marketing functionaries are also suffered from one or more problems. Traders are facing the problems of collection from small and scattered production pockets, irregular supply, ungraded, and low quality fruits. There were many problems existed for quality production and marketing in present production system thereby, farmers have been discouraged (DADO, 2003). Therefore, District Agriculture Development Office, Nawalparasi has realized the need of multidisciplinary survey and research to identify problems and their possible solutions. Therefore, the study was undertaken to -

1. identify production and marketing constraints of banana enterprises in Nawalparasi .
2. determine researchable needs for quality production and marketing of banana.

MATERIALS AND METHODS

This study involved a combination of methodologies such as *insitu* observation, key informant survey, focus group discussion, Participatory Rural Appraisal (PRA) and Participatory Market Appraisal (PMA) conducted by multidisciplinary team consisted of horticulturist, soil scientist and plant protection specialist. Inventory on commercial growers were also collected from District Agriculture Development Office (ADO) Nawalparasi. Information on production system, production constraints, knowledge on diseases and pest and their management, and production potentialities of orchards were collected through personal interview technique. Individual farmer's fields were visited to identify core problems. *Insitu* observation was undertaken to acquaint on soil moisture, pH, orchard condition, insect pest and diseases status, planting geometry and cultural practices adopted by the individual growers. PRA was conducted with the involving of 36 commercial farmers including two collectors by using checklist (Annex 1 and Annex 4). Literature review was also carried out to update the secondary information and validation. The facts and figures are largely based on the perception of selected farmers and traders as key informant. To guard against misinformation, particular care was taken to verify and crosscheck interview and review secondary information.

Given the limitation of time for field survey and the methodological approach adopted during study, it was not possible to study the problems in great depth and wider areas. As

with all studies on rapid appraisal and key informant information, misinterpretations, intentional or unintentional bias were significant risk.

RESULTS AND DISCUSSION

Existing practices and technology gap

Manuring and fertilizer application

It was found that there was not uniformity in the rate of fertilizer application. Farmers applied fertilizer in the ratio of N₁₀₅:P₉₂: K₉₀ to N₁₂₀:P₈₆:K₁₁₂ kg/ha. However, the time of fertilizer application is found to be same for all the growers. Farmers used fertilizer in three split doses, first at transplanting time, 2nd during the month of June and 3rd at August. The ratio of commercial fertilizer is 100g DAP: 100g MoP: 100g Urea to 100g DAP: 100g MoP: 50g Urea per plant per application. So one plant received 200g DAP, 200g MoP and 100g to 200g urea.

Banana is a heavy feeder and it exploits from limited soil depth due to shallow root system of the crop (Rao, 1998). It was found that plant densities ranged from 1800 to 2400 per ha when crop geometry was 2.5 X 2 m². Thus, present practice of fertilizer application with 360 kg DAP, 360 kg MoP and 180 to 300 kg urea/ha supplied 180 to 200 kg N, 160 kg P₂O₅ and 210 kg K₂O/ha. Potash demand is very high in banana (Rao, 1998). Various experiments have formulated NPK ratio should be 1:1:4. Absorption of N and P₂O₅ is faster at 15th leaf stage to flowering stage and least at shooting. Potash applied after shooting does not seem to affect the finger size (Samson, 1980).

Desuckering

Farmers did not know about desuckering. Most of them did not know on sucker killing technique. They adopted desuckering practice at only once in a year. They cut suckers at the ground level and did not use urea to kill it which required high labors. It has been recommended that suckers should not be allowed to become big before they are cut off. It is necessary to maintain only one sucker after bunching.

Variety and orchard size

Jhapanli Malbhog and Local Malbhog were the dominating cultivars of banana in the pocket areas of this district. The introduction of Jhapali Malbhog was from Jhapa, and has been popular in Kawashoti and Shiva Mandir VDCs whereas local Malbhog has been dominating in Belhani, Narayani and Prasuni VDCs. The finding was also reported by ADO, Nawalparasi (DADO, 2003).

The orchard size was ranged from one Kattha to 2.5 Bighas of land and orchard age ranged from recently established to 10 years old with ratoon cropping system. Plant population ranges from 1800 to 2400 per ha.

Cropping system and soil moisture management

It has also been observed that banana is cultivated as sole crop in all the pocket area. However, maize was used as intercrop during the first year of the orchard; farmers did not practice intercropping afterwards. There was also lack of planting windbreaks to protect the crop from heavy wind. Moreover, propping the bunch initiation and growth has also not been practiced. Most of the orchards were rainfed. Due to the lack of irrigation facility, farmers did not water after transplanting even at drought months. Due to inadequate soil

moisture, plants collapsed during hot months but after rainfall, the growth enhanced and rejuvenated. This has led to winter months from bunch initiation to crop harvesting. So, banana harvesting in winter months has been realized as the specific feature in major pocket areas of the district.

Farmers have been transplanted banana suckers of one year old available at own village nursery during February to March and June to July. The crop geometry was 2 X 2 m² with a pit size of 45 cm depth and 30-45cm diameter. Pits were filled with a Foret @ 10g and 15-20 kg of FYM. They did not practice irrigation for the newly transplanted saplings. The main drawback of the orchard was lack of planting windbreak and propping the bunching plant. Intercultural operation was very poor in terms of weeding and earthing up.

Existing cost of production and return

The estimated production cost has been found to be Rs 35 to 40 per plant. The plant population has ranged from 1800 to 2400 per ha. This led to the production cost from NRs 66700 to 96000. Average production has been reported to be 125 finger per bunch and thus total production of 3000000 fingers per ha. If farmers gate price of Rs. 80 per 100 fingers, net income ranged from NRs 144, 000 to 160, 000/ha. However, the income has reduced due to poor fruit quality leading to low market price. Some growers themselves and neighboring local traders were acted as suppliers. Banana of Shiva Mandir and Kawasoti was marketed by local retailers and or wholesalers (*Bhatti owners*). Price has been found to be highly fluctuating from NRs 45 to 90 per bunch within a year (ABTRACO, 2004).

Existing situation of producer cooperatives or groups

It was reported that growers were organized into producers group (local CBOs) but they were inactive in their activities. Agriculture Market Management Adhoc Committee in Shiva Mandir VDC-3 has been recently formed to manage, cooperate and provide services to the growers in organized form, thereby strengthened, vitalized and supported to banana enterprise. Most of the growers have to sell their product to the local collectors in credit. Some collectors did not pay and even did not contact the growers. Therefore, there was acute problem of marketing in the area. At present, none of the growers were getting contractual advances for their orchards. On the other hand, farmers were not aware on the organization of cooperative and its beneficial role for the disposal of their product. Consequently, growers were lacked in self-reliance on collection, grading and marketing their product.

Existing situation of local market functionaries

There were few local collectors and traders for banana marketing in the VDCs. Bhim Lal Sapkota and Gopal Prasad Pokhrel, a permanent residence of Shiva Mandir-2, were the key informants during the field visit. Bhim Lal Sapkota has started his business as collector on the basis of commissions during the year 2058. In 2059, he collected 100 trucks of banana from the farmer's field and sold at Kuleswor Wholesale Market. During collection, he used to visit orchards and cut bunches without grading. At that time, the farm gate price was NRs 80 per 100 fingers and sold at NRs 120 per 100 fingers at Kuleshor. He hardly competed with Indian banana traders. Import of Indian banana was reported to be doubled than the supply of Nepalese banana. During transportation, Nepalese traders have transported banana without any packaging materials but Indian traders used leaves and cushion materials.

Core problem analysis

Production and marketing constraints

There was low profit from banana enterprise in this district. The problem in banana cultivation is attributed to low quality of production and seasonal glut thereby low market price at harvest. Low production in banana was identified mainly due to poor orchard management. Similarly, poor fruit quality and seasonal glut were found to be the major reasons for low market price at harvest (Figure 1).

Poor orchard management

There were serious sorts of crop husbandry practices like manuring, weeding, irrigation and bunch trimming. The major input problem has been found to be the lack of irrigation facility. Farmers were heavily depending on rain water. The time and grade of top-dressing that farmers were practicing was found to be inappropriate.

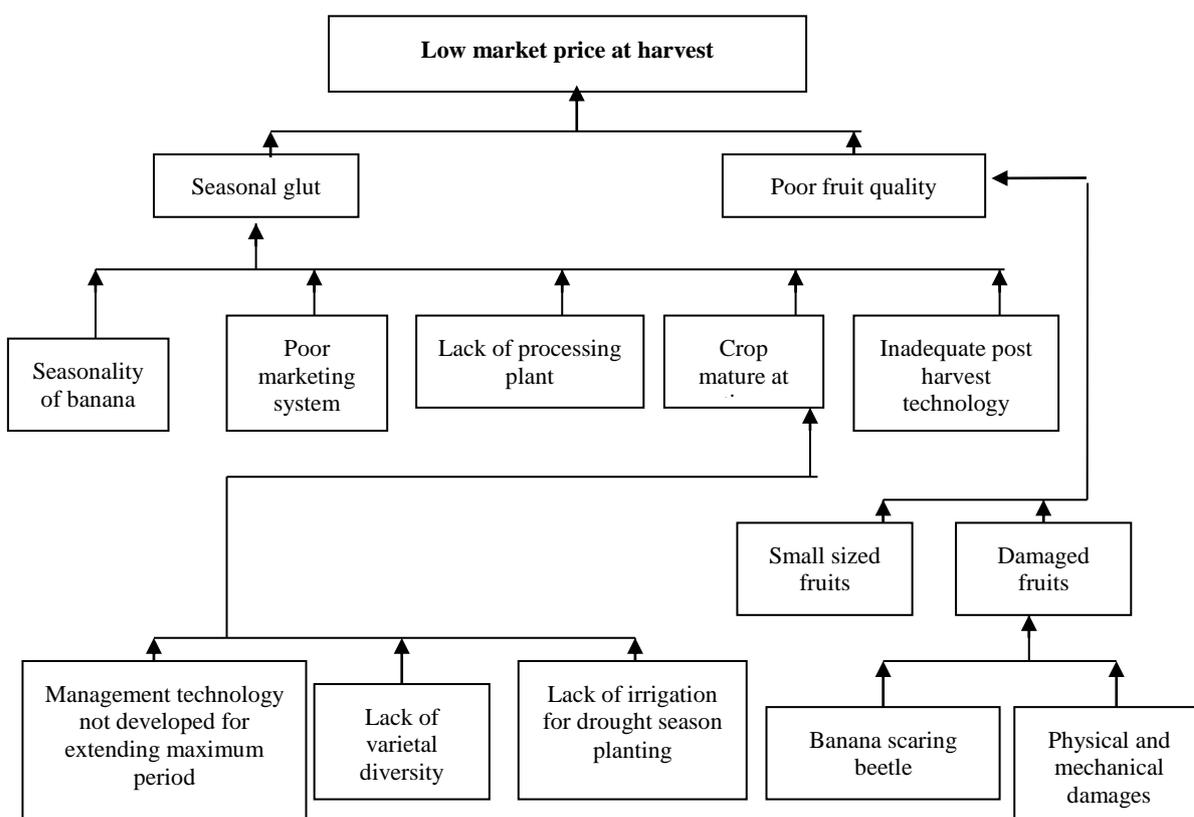


Figure 1: Core problems related to low market prices of banana at harvest in Nawalparasi, 2004.

Poor quality fruit

Almost all the banana genotypes have qualitative and quantitative traits and poor fruit quality has been identified as one of the factor contributing for low market price. Low fruit quality was due to attack of leaf scaring beetle to the growing fruits at bunch initiation time. Poor quality was also attributed by small fruit size, which was due to poor orchard management particularly lack of desuckering in time, irrigation and bunch trimming.

Seasonal glut

Banana fruit as any other fruits are perishable in nature. Banana harvesting season was reported to be concentrated from November to March, thereby glutting in market, leading to low price as well as spoilage ((ABTRACO, 2004).

Quality production to fetch high price should be done by adjusting planting time. February to March planting should be done by which produce can be harvested in high market demanding season i.e. September to November in the first and July to August in the 2nd year. Poor fruit quality is due to leaf scanning beetle and inadequate potash application. This situation of poor fruit quality and low market price has been found to be attributed by many reasons (Figure 1).

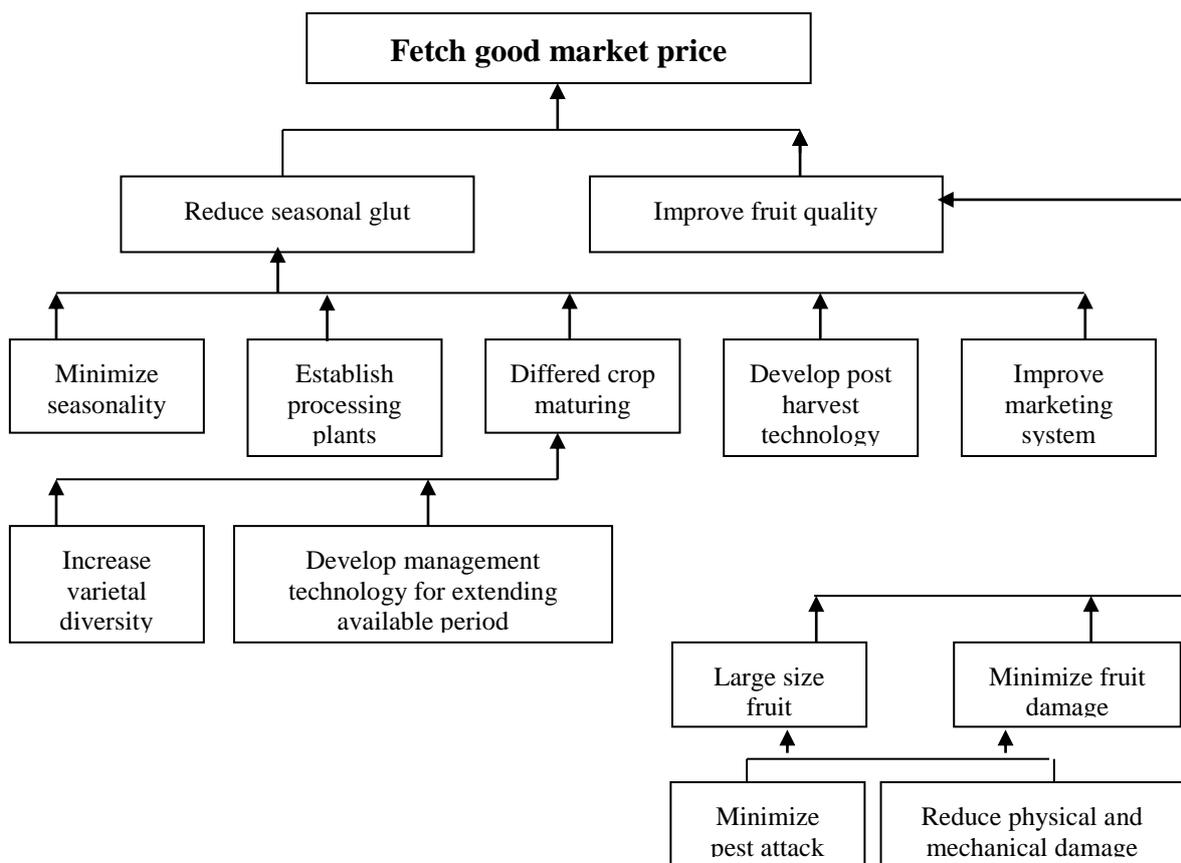


Figure 2: Suggested objective tree to solve marketing problems of banana in Nawalparasi, 2004.

RECOMMENDATIONS

The marketing can be improved if the following Research strategies are employed.

Research strategies

This situation can be overcome by the phased selling of the product, which is possible with the aid of post-harvest technology, storage facility, improving marketing system, establishing processing plant and breaking seasonality through varietal diversity and manipulation in cultural practices. To reduce seasonal glut and improve fruit quality, following strategies has been suggested (Figure 2).

Banana crop is highly exhaustive crop and it needs continuous orchard management. Removal of unwanted suckers is one of the critical operations in banana orchard. Majority of the farmers did not know about desuckering, bunch trimming and top dressing. Gautam and Baral (2001) observed highest yield in William hybrid banana planting with three uniform suckers in a clump at 3 m for clump to clump and 30 cm within the clump for each plant (Figure 3). They reported that yield was increased with increasing plant up to planting 3 uniform suckers in a clump.

Beyond 3 plants within a clump, there was decreased in size of fingers and weight of bunch. With increased in number of plants, there was increased in the total number of plants and thus increased in yield.

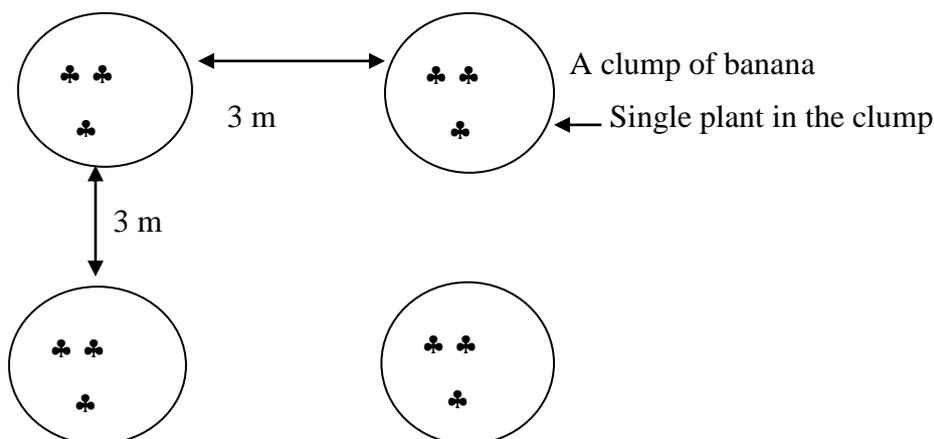


Figure 3. High-density planting of 3 plants in a clump suggested for Nawalparasi, 2004.

The system of one plant about to bear a bunch (the mother) and one follower (the daughter) has been generally adopted in developed countries. A third plant, which is a follower of the daughter, (grand daughter) is allowed to remain after the inflorescence has appeared. If these three plants were left standing in a straight line, the original spacing would soon be disrupted. Therefore, a rotating succession should be practiced (Samson, 1980) (Fig 4).



Figure 4. Two desuckering systems of banana high density planting suggested for Nawalparasi district, (a) rotating succession of desuckering and (b) linear succession of desuckering.

Development strategies

Awareness creation: Knowledge on banana enterprise and its marketing is essential. This is only possible through farmers led workshops, group discussion and final consensus. Training for empowerment and capacity building of CBOs has realized by the team.

Market information: It is essential to conduct market survey in order to identify peak time of demand, as well as quality and quantity.

Linkages and coordination: It has to be further strengthened and developed strong linkages with government, NGOs and private wholesalers. Individual farmers have to commit to support their cooperative/producers' groups.

Reasonable pricing of the product: Participatory method of price fixing should be practiced. The price fixation should be based on the production cost.

Empowerment of CBOs and individual farmers: Focus should be given to the implementation of activities by identifying the key or nodal farmers who are most active and enthusiastic in banana trading. Capacity building through skill development and provision of support and subsidies during initial stages of the implementation are essential for further strengthening market opportunities and networking. Instead of depending on government grants and subsidies, CBOs (Cooperatives and producers groups) should use their own local resources for small market infrastructure development to create ownership thereby increasing participation of the growers. The recently organized Agriculture Market Management adhoc Committee has to be strengthened and supported to solve the existing marketing problem. Marketing Cooperative need to be organized and provide supports from outside agencies for initiation.

It is recommended that production tree problems should be solved by virtue of research and development efforts. Adjusting planting time and season should avoid seasonal glut. Cooperative strengthening and linkage development should be taken into consideration for sustainable production and marketing of banana produced in this district and thereby commercialization.

ACKNOWLEDGEMENTS

We are grateful to Mr. Gopal Pd Shrestha, Officiating Director, Fruit Development Directorate, Kirtipur, Dr. Kedar Budhathoki, Chief, HRD, Khumaltar for their keen interest, and assessor facilitation for the study. We are very thankful to Mr. Sambhu K Shrestha, Chief, Agriculture Development Office, Nawalparasi for his suggestions and facilitation during the field study. All the participants, particularly banana growers and traders, without their tireless efforts and patience, this study would not have been possible. Hence our thanks also go to them.

REFERENCES

- ABTRACO, 2004. Study on market situation of banana and papaya produced in Nawalparasi district: A consultancy report (Nepali). Agriculture Business Trading Research Cooperatives, Anamnagar, Kathmandu.
- ACD, 2001. Fruit cultivation technology (*Falful Kheti Prabidhi*). Agriculture Communication Division, Nepal.
- APSD, 2002. Statistical information on Nepalese Agriculture 2001/2002. Ministry of Agriculture and Co-operatives, Agribusiness promotion and Statistics Division, Singh Darbar, Kathmandu, Nepal.
- Gautam, D. M. and I. P. Gautam, 2002. Appropriate planting time and clump management practices for banana cultivation. J. Inst. Agri. Anim. Sci. 23: 21-27.
- DADO, 2003. Agriculture development program and achievement at a glance (Nepali). Agriculture Development Office, Nawalparasi.

Gautam, D. M. and D. D. Dhakal, 1993. *Falful tatha Audhagic bali* (in Nepali). Pabitra
Tatha Rupa Publication, Bharatpur, Chaitwan.

Rao, V.N.M., 1998. Banana. Indian Council of Agriculture Research, New Delhi.