Review Article

AN ASSESSMENT OF DIFFERENT TOOLS USED IN MONITORING OF PLANT CLINICS IN NEPAL

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ABSTRACT

Nepal started plant clinic in 2008 to provide spot diagnostic services especially for small holders. Field diagnosis of crop problems and recommendation for the solutions are quite technical tasks. Regular monitoring is very essential for the quality control of plant clinic as well as for backstopping to the plant doctors. Plant clinic quality has been determined by many factors like coordination with local stakeholders, academia, diagnostic laboratories, media, and care for clients. Considering these facts, different monitoring tools were practiced in 2016 with the support of CABI led Plantwise program. Similarly, Plantwise also developed knowledge bank along with the data storage system called as Plantwise Online Management System (POMS) with the help and through which also plant clinic can be monitored. So data restored from POMS were analyzed by taking various parameters for the table monitoring and other monitoring tools were assessed in the field for their practicability. It is concluded that the established system of knowledge bank including POMS and developed monitoring tools along with general observation of plant clinic is useful for the plant clinic monitoring.

Key words: *Diagnosis, monitoring, plant clinics, plant doctors and recommendation*

INTRODUCTION

Simply monitoring is to observe the track of performance in a systematic and an organized way and correct if the ways are deviated from the defined objectives of that performance (Simister and Smith, 2010). The general objective of monitoring is for the improvement of certain task (Millstone *et al.*, 2010). Performance monitoring of agricultural extension is weak in many developing countries, where monitoring is often done haphazardly and mostly for accountability purposes, less so for learning and decision-making (Danielsen *et al.*,

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2015). Monitoring of agriculture extension activities in Nepal has been carried with the support of several laws, rules, regulations and guidelines. Methods of monitoring ranges from field level supervision, system of reporting to the higher level of organization to review meetings in the quarterly basis. A separate monitoring and evaluation section exist from the district level offices to the ministry. Extension providers tend to regard monitoring as something done by 'others' for bosses and donors. Yet, ability to monitor owns performance is a key element of institutional capacity (Kusek and Rist, 2007). Monitoring and evaluation is the powerful public management tool that can be used to improve the way government and organizations achieve the objectives (Kusek and Rist, 2014), it facilitates decision making process (Kusek and Rist, 2007). Plant clinic, an agricultural extension tool which provides the plant health advisory services to the farmers, has been initiated in Nepal since 2008 (Adhikari *et al*., 2017a). Majority of farmers are smallholders with very less knowledge about plant health problems and even the suitable place where they can get the appropriate advice for the plant health problems. Plant clinics can provide them these services in their own places (Adhikari *et al*., 2017b). So, it has readily internalized within the government system and adapted by the farmers. CABI led Plantwise program has a continuous support through the local implementing partner Plant Protection Directorate (PPD). It is highly technical task for the plant doctors. Therefore, regular backstopping for them is very necessary. A strong network among every stakeholder from diagnostic laboratory to academia and research institutions is essential for the better functioning of plant clinic. Results-based M&E differs from traditional implementation- focused M&E in that it moves beyond an emphasis on inputs and outputs to a greater focus on outcomes and impacts (Kusek and Rist, 2004). CABI Plantwise program supported PPD for making different tools and system of plant clinic monitoring. These tools; Monitoring Plant Clinic Linkages (MPCL), Monitoring Plant Clinic Performance (MPCP), Awareness and Advocacy Monitoring (AAM), Training Quality Evaluation (TQE), Information Material Checklist (IMC) and the system; Plantwise Online Management System (POMS) are being used for the monitoring purpose of plant clinic performance. The tools and system used for the monitoring are designed to be result based monitoring and evaluation. Results-based monitoring and evaluation (M&E) is a powerful public management tool that can be used to help policymakers and decision makers track progress and demonstrate the impact of a given project, program, or policy. This paper highlights the assessment of different tools for the monitoring plant clinics in Nepal.

METHODOLOGY

Different tools were used to monitor the plant clinics and assessed by using them in different clinics and general reviews. Tools used in monitoring are Plantwise Online Management System (POMS), Awareness & Advocacy Monitoring (AAM), Monitoring Plant Clinics & Linkages (MPCL), Information Materials Checklist (MPCL), and Training Quality Evaluation (TQE). Plant clinic data from September 2013 to June 2018 were

retrieved from POMS were analyzed by a simple analysis. Discussion with the plant doctors on the various issues during cluster meeting were also carried out. Monitoring tools were developed by organizing a monitoring workshop in 2016 at Kathmandu, Nepal, for the assessment of plant clinic, its quality, quality of plant clinic related trainings, assessment of the plant clinic promotion activities, their linkages with relevant stakeholders etc. The participants were from different institutions, which were recognized as the major stakeholders in the plant health system in Nepal.

RESULTS AND DISCUSSION

POMS to monitor the quick status of Plant Clinic

Plantwise Online Management System (POMS) is very useful for obtaining the information regarding the plant clinics in the country. Three types of clinics, namely: regular plant clinic with the 4 letters and 2 digit code as NPDN01, mobile plant clinic with the 6 letters code as NPDNMO and office plant clinic with the 6 letters code as NPDNOF has been observed to exist on practices. The first two alphabet denotes for the country name and the second two alphabet stands for district name. The digits like 01, 02 imply the regular clinic of one place and another place, respectively whereas the last two alphabets as MO and OF stands for mobile and office types of clinic, respectively. The data and information regarding pests and diseases obtained from these three types of clinic can represent the scenario of whole district and thereby be the reliable source of information for pest surveillance purpose. Seventy-nine of such clinics were seemed to submit data on POMS. Total numbers of clinic sessions are 757, where 5790 queries of farmers were addressed. 533 times of field visit were arranged for the further diagnosis and recommendation for the plant health problems, which is 9% of total queries. Thus, the average number of field visit per session is less than one. Similarly, total numbers of samples refer to the laboratory 130 which is only 2.2%. This shows the less linkage between the diagnostic laboratory and plant clinic. The major causes for this poor linkage could be both the receiving strength as well as diagnostic capabilities of regional diagnostic laboratories and practices of plant doctors to send the samples into the laboratories. No specialized human resources, less infrastructure facilities on existing laboratories and less intension of farmers to wait to a longer period for diagnosis are found to be the major reasons over this issue from the discussion with plant doctors during cluster meetings. Tomato is the crop which has the highest number of cases. 16% of total cases were of tomato which is followed by paddy with 7.2%. The tomato is cash generating commercial vegetable crop in Nepal.

Table 1. Top five crops registered in plant clinics

Crop	Total queries	Frequency (%)
Tomato	909	16
Paddy	418	7.2
Cucumber	347	6
Cauliflower	343	6
Chilly	294	5

Late blight disease has been observed as the most common disease in tomato which has the frequency of 23% of the total problems of tomato. The second most common problem has been observed Tomato leafminer (*Tuta absoluta)* with 19% of the total tomato problems (Fig. 1 and 2). Other problems based on the frequency in this top crop are virus diseases, bacterial diseases, leaf miner, fruit borers, early blight, and root knot nematode, respectively. Upon the observation of trend of recommendation by plant doctors, cultural recommendation was observed as the most common. Around 65% recommendation involves the cultural recommendation. Plant doctors often suggest for the IPM practices. Regular crop health monitoring has also been emphasized for the management of crop health problems. Thirty eight % recommendations are found to be with the suggestion of crop monitoring. There were 34% recommendations with insecticides and with same frequency of fungicides recommendations. Only 22% recommendations are biological control and around 4% recommendation was about using resistant varieties (Fig. 3). This shows the trend of recommendation by plant doctors resembled with the IPM practices. However, reasons for less recommendation of resistant varieties and even the biological control method has to be found out with the further study and analysis.

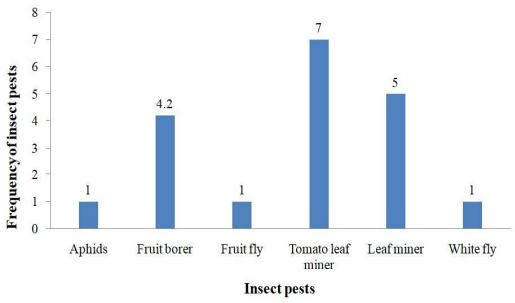

Fig. 1: Insect pests in top crop (tomato)

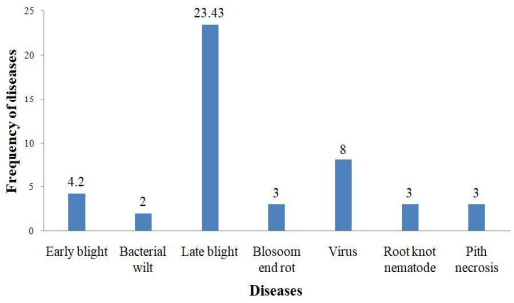

Fig. 2: Diseases in top crop (tomato)

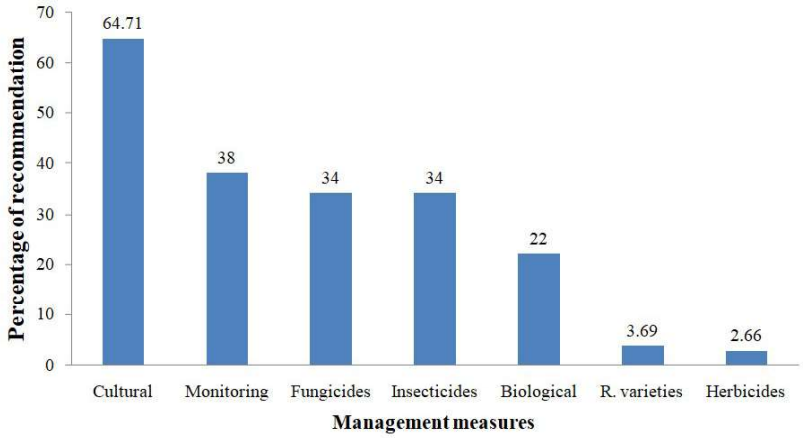

Fig. 3: Trend of recommendation by Plant Doctors

Use of information material

Commonly used information materials are PMDGs and factsheets developed by and with the support from CABI-Plantwise program. PMDGs and factsheets are readily available in Knowledge Bank of Plantwise website. Two factsheets and six PMDGs about the top problem of top crops are found in the Knowledge Bank which is enough for the plant doctors to take the reference. However, no factsheets and PMDGs are in the local language, which could support to the plant doctors with English language problems, if PMDGs on the top problems of top crops could be prepared in Nepali language. Plant doctors' reckoners was also found as a commonly used information material. Plant doctors' reckoner is the compilation of essential information extending from Photo Sheets, PMDGs, Factsheets, Pamphlets, Posters and list of input suppliers in one folder. Books, posters, pamphlets and broachers published from NARC and PPD are found to be useful for the plant doctors. Some plant doctors were found to be using their own notes prepared by themselves. The preparation of such materials should be based on the severity of problems and based on the experience of the authors. Local language would be easier for the plant doctors to understand. Availability and portability to the field of these types of materials is also crucial.

Information materials checklist

This checklist is found to be very useful to collect the information regarding the information materials. The heart of plant clinic is the diagnosis followed by recommendation. Both of them require technical knowledge and plant doctors cannot always complete their tasks only with their memory. They should be regularly provided with the recent issues, development and knowledge in out disk. Making available of these types of knowledge sources is crucial

for the quality maintenance of plant clinic. So, supervision about the availability, relevancy, understandability, coverage, attractiveness, authenticity of these types of materials is very essential. Thus, based on the experience of using information material checklist developed jointly by CABI and PPD has been found to be relevant and easy to use. It is equally helpful for trailing the plant clinic towards its objective by using essential technical information from the published materials.

Monitoring Plant Clinics & Linkages (MPCL)

Plant clinic, in fact, is one of the supportive activities of huge and broad term that is plant health system. There are numbers of role players in the system. Extension workers other than plant doctors, agro-input suppliers, elected as well as political leaders, farmers groups, their cooperatives and federations, media, research institutions, academia, local laboratories are the key stakeholders who hold the major role in making the program successful. Involvement and complementary support from these stakeholders are the indicators for the particular activity advancing forward. So, the checklist was prepared for MPCL. It basically involves the monitoring of plant clinic environments and its connection with other stakeholders. These connections might be during the plant clinic as well as after the plant clinic event.

Training Quality Evaluation (TQE)

Diagnosis of plant health problems is not an easy job. The whole chain of this task starts from basic agricultural education and greatly depends on the training provided for the field diagnosis. Other exposures are equally important to improve the quality of diagnosis and recommendation as well. Plant clinic module 1 and module 2 are the basic trainings while plant clinic event, cluster meetings, other interactions and trainings are supportive. So, quality of these types of events greatly reflects the ultimate quality of the plant clinic. Regular monitoring and supervision of the training is essential for the quality control issue. For this, Training Quality Evaluation (TQE) has been prepared and placed inaction. This tool covers the subject contents, quality of contents, condition of training venue, quality of trainers and trainees etc.

Awareness & Advocacy Monitoring (AAM)

There are many factors which play great role for successful conduction of clinic event. Advertisement among the farmers, display of banners & photo-sheets, selection of the venue especially considering the gender perspective, attitude of plant doctors and other clinic staffs, etc. are the major factors to be considered. The AAM tool covers all of these aspects.

DISCUSSION

Monitoring the performance of interventions is both opportunity as well as a challenge, and for complex activities like delivery of plant health advisory, its relevance becomes highly important and relevant. Over the years, Plantwise programme explored scientific ways to keep monitoring tools simple (self-assessment), effective (timely) and relevant (dynamic). Danielsen *et al*. (2015) acknowledged the value of critical self-assessment for improved performance and decision-making. The team in their study mentioned that having both field staff and their supervisors on board plays effective roles in performance monitoring of plant clinics. These tools are synchronized through the process of programme operations like mapping the quality of trainings, assessing the delivery of advises through plant clinics, watching the content development and its relevance, observing the responses on advocacy, effective communications etc. Bentley *et al.* (2018) explores how communication and its technical content shape farmer's response to advice delivered at plant clinics.

Powered with POMS, these monitoring tools become handy in evaluating the effectiveness of plantwise approach be it classification of clinic codes or seeing the real-time based clinic data. Adhikari *et al.* (2019) observed that different types of recommendations by plant doctors in terms of advisory are mutually inclusive that is cultural, monitoring, resistant varieties and use of biological, chemical insecticide or fungicides, the total percentage nears to 100%. With the help of POMS and clinic codes, data can be viewed clinic-wise, day-wise, month-wise or year-wise thus helping these M&E teams to track the programme and measure the quality parameters. Adhikari *et al.* (2018) elucidates that this by explaining the diagnostic counts in case of fruit fly that were recorded in POMS Nepal page. He mentions that among 3268 entries from September 2013 to July 2016, about 298 were of specific to this pest only. Plantwise tools become handy in tracking also the quality of training materials e.g., TQE gives idea to M&E team regarding the needs for customization or improving the location specific materials of the training resources and also keeps watch of availability of quality content to field teams like plant doctors.

CONCLUSION

Plant clinic is providing a dual service to the farmers. One is a direct advisory service and otherone is establishment of surveillance system with the systematic information collection and management system. This system of data management ultimately benefits the farmers. Similarly, establishment of monitoring system and giving emphasis for the quality assurance and management of plant clinic is appreciable. Tools used in monitoring process were observed to be comprehensive and realistic. However, some improvement on these tools can be recommended. Replacement of paper-based tools with electronic version might save the time and effort as well as add value for further systematizing the process.

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