HOW TO ORGANIZE COPING WITH CROP DISEASE RISKS OF FARMERS IN POOR COUNTRIES

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Introduction

Disease warning systems (or disease forecasters) are decision support tools that help decision makers to assess the risk of outbreaks of seriously damaging crop diseases. Using information about weather, crop and pathogen, warning systems advise (as agrometeorological services) when farmers need to apply a management action, to tackle or prevent disease outbreaks. Disease warning systems are also key elements of Integrated Pest Management (IPM) efforts to reduce the excessive use of chemical pesticides.

Key issues

Most warning systems have not made the transition from scientific validation to real world application as agrometeorological service (Paulo Sentelhas, private communication in Maracay, Venezuela, 2007). Why are so many of these IPM tools unused? Logistical barriers to application of warnings have to come down.

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Once a disease forecast is available, these are for example (Paulo Sentelhas, private communication, 2007, from a review paper under review for *Scientia Agricultura*, Brazil):

- inconvenience & complexity;
- added costs;
- added labour;
- difficulties to respond timely;
- unsuitable weather data (air temperature, rainfall, relative humidity, leaf wetness duration in particular);
- unsuitable weather forecasts;
- interpolation needs.

To these barriers may be added for our APN developing countries:

- non-existing or not yet most suitable communication channels.

From conclusions of Sentelhas (private communication, 2007, from the same review paper under review for *Scientia Agricultura*, Brazil) one may derive that in developing countries, public service providers (using product intermediaries) can package crop disease warning systems as products of research into formats that fit farmers' needs (Stigter, 2008). The latter should provide feedback through extension intermediaries, for those systems that are sufficiently valuable and user-friendly, for improvements, to product intermediaries, of whom some are researchers. Reliability of weather data inputs is the backbone for sustainability of such schemes (Stigter, 2008).

What we concluded earlier

In a paper for the Hyderabad meeting (Stigter, 2006) it was stated that it should be realized that forecasts, predictions, models, decision analyses, communication methods (including participative research) are tools that only become (information) products when they can be operationally used by others down the line towards farmers for better preparedness and mitigation decisions;

It was also stated in that paper (Stigter, 2006) that from the project proposal the following explicitly wanted products can be read (on which an earlier defined differentiation had to be applied):

- Application of predictive capacity in terms of climate, weather, disease and production capacity in combination;

- Model framework application in farm and policy decision making;

- Management strategies/practices relating to pesticide usage to meet climatic circumstances and minimize crop losses.

To be effective at the farm level, these three products have to be applied collectively.

The question was where and how to focus to bring products operationally to problems (still with the differentiations applied):

- collect existing agrometeorological services of the kind related to the products identified in the proposal, if any; determine the communication channels;

- determine which (information) products need to be focused on which priority problems and which applied scientists (from which institutions), extension intermediaries and farmers should be involved in making these products into services along which communication channels;

- *organize the establishment of such agrometeorological services in risk communication along the right channels.*

Discussion

Bringing the analysis of Sentelhas as given above to our approach, for our work it applies to "Application of predictive capacity in terms of climate, weather, disease and production capacity in combination"

Only in India this has been tried. That experience we summarize in the PowerPoint presentation that may be requested by e-mail.

There is a list of weather based pest and disease models and their use is exemplified by a pest weather calendar for "Gall midge" in rice. Conditions for weather warnings are given together with weekly normal weather conditions for September and October and the mean dates of important epochs of crop growth and pest development. This way, moments for action can be determined.

The mechanism for preparation of agrometeorological products in India was dealt with earlier in this meeting. An example of application of a pesticide against "Pink ball worm" in cotton in Akola is given and how this is taken up and shown in the Agromet Advisory Services.

At present sporadic experiments are being conducted at agricultural universities to further develop and apply weather based pest and disease forewarning models. It is planned to carry out such experiments in more organized manner at all 127 Agricultural Meteorology Forecasting Units for developing pest and disease weather models for important pests and diseases for major crops.

In Bangladesh and Cambodia any level of organization for these matters has not included the NMHSs. In Bangladesh, Farmer Field Schools (FFSs) have been operational for IPM. FFSs have also been applied in Cambodia.

Issues we brought up in the most recent correspondence with the group are as follows:

- Extension should be organized at the lowest administrative level, because "effective and accountable local authorities are the single most important institution for reducing the toll of natural and man made disasters" (Sahni and Ariyabandu, 2003);

- The least we could do, within the context of our APN project, is to come up with advocating a strategy of how to organize this involvement of the users, including the farmers as end users;

- Stigter was in 2007 involved in three examples in Indonesia of government organized "Farmer Field Schools", two being "Climate Field Schools".

Conclusions

So, the only concrete thing we have to offer is this upcoming model of government organized "Farmer/Climate Field Schools" in which extension intermediaries sit with farmers to discuss risk communications as agrometeorological services and "what communications should be made and how" to serve them best.

Indeed a very strong future project could be built around setting up of "Climate/Farmer Field Schools" for disease risk communications, leading to the establishment of agrometeorological services for participating farmers.

We have been impressed by their use for various problems in Indonesia (e.g. rice planting date, in-field water management, coffee plantation surface management).

These disease risk communications should be based on:

(i) improved needs assessments;

(ii) the related products discussed by others in our present APN project;

and

(iii) getting rid of the logistical barriers (as a key issue of Sentelhas' analysis).

An important method to discuss how to get rid of logistical barriers would be the organizing of Climate Field Schools designed in our case for determining action against a particular pest or disease bound to occur in an area.

References

Sahni, P., Ariyabandu, M. M., 2003. Disaster risk reduction in South Asia. Prentice-Hall of India, New Delhi

Stigter, C.J., 2006. Agrometeorological services in the context of climatic aspects of coping with crop disease risk. Paper presented at the Asian Pacific Network scoping meeting of the project "Climate and crop disease risk management: an international initiative in the Asia-Pacific Region", 6 – 10 November, Hyderabad, India. Agromet Vision, Bruchem, 5pp. [Also available as PowerPoint presentation.]

Stigter, C.J. 2008. Operational agrometeorology: problems and perspectives. Submitted invited contribution to a "Souvenir booklet" for a conference in Hyderabad, India. CRIDA, Hyderabad.