



CLEAN PLANTING MATERIALS AND REGULAR PEST MONITORING TO CURB THE HIGH INCIDENCE OF SWEETPOTATO PESTS

by: Grace S. Backian, Jophr L. Galian and Ammie D. Ngaotoy



HIGHLIGHTS

✓ The fungus *Fusarium oxysporum f. sp. batatas* was positively identified as the causal agent of the sweetpotato disease that affected the sweetpotato crops in Benguet and Nueva Viscaya. This sweetpotato fusarium wilt (SPFW) hits sweetpotato crops regardless of area and where it was planted.

✓ The disease was first observed in 2012 by 92 to 94% of farmers who grew sweetpotato both as cash crop and for home consumption. SPFW was considered the most damaging, among all the pests and diseases by 100% of the growers. SPFW infestation was rated as severe and caused a decrease in root yield from 76 to 100%.



Climatic conditions and planting materials saved from previous crops were among the probable causes of SPFW incidence.



Swerte, Kalbo-oy, Gislayan sweetpotato varieties were identified by the growers as tolerant to SPFW. These tolerant varieties were able to yield at least 25% of the potential yield despite of severe infection.



Production and use of clean planting materials can be done to ensure sustainable sweetpotato production.



Regular field monitoring particularly of diseases and other economically important pests should be strengthened through collaboration with the Department of Agriculture and the academe.



INTRODUCTION

Sweetpotato (*Ipomoea batatas* (L) Lam.) is the sixth most important food crop after rice, wheat, potato, maize, and cassava. As part of the farming systems, sweetpotato is a food security crop in the olden times and has a very considerable commercial value at present. Sweetpotato remains a supplementary staple in some remote parts of Benguet. For *Kalanguyas* in Nueva Viscaya, it is a cash crop because of the high demand for it.

Pests and diseases are still the most important constraint to sweetpotato production. Pest management practices done by sweetpotato farmers are integrated into their cropping pattern and cropping system, but these practices are not effective enough because of the changing climate and other environmental factors. During a survey on Indigenous Knowledge (IK) on root and tuber crops (RTC) in 2012, farmers discussed this problem, reporting wilting and death of their sweetpotato crop. In 2014, the Kayapa Local Government Unit (LGU) sought the assistance of the Department of Agriculture (DA) and the Benguet State University (BSU). The disease was confirmed to be fusarium wilt. Mitigating efforts

such as mass propagation and dispersal of clean planting materials were implemented in 2014. Information dissemination on good agricultural practices, clean planting material production and dispersal, and varietal screening for resistance to the disease were initiated.

This brief paper presents the results of a study which identified the municipalities and villages affected by SPWF; assessed SPFW incidence and severity; and documented university, line agency, and local government collaboration in providing mitigating solutions to reported pest and disease problems.



METHODOLOGY

The study was conducted in selected sites of Benguet and Nueva Vizcaya (Figure 1). Selection was based primarily on the secondary data gathered from the municipal local government units which include area planted to sweetpotato and prevalence of sweetpotato fusarium wilt. Group interviews, focus group discussions, field observations, and laboratory analysis for validation of results were done. A total of 132 farmer respondents were interviewed; 86 sweetpotato growers from Benguet and 46 growers from Nueva Vizcaya. Majority (79%) of the respondents were female and 21% were male. Incidence of SPFW was measured by the total number of farmers who observed fusarium wilt symptoms over the total number of sweetpotato growers interviewed multiplied by 100. Severity was measured from the point of view of researchers as assessed by the potato growers through field observation

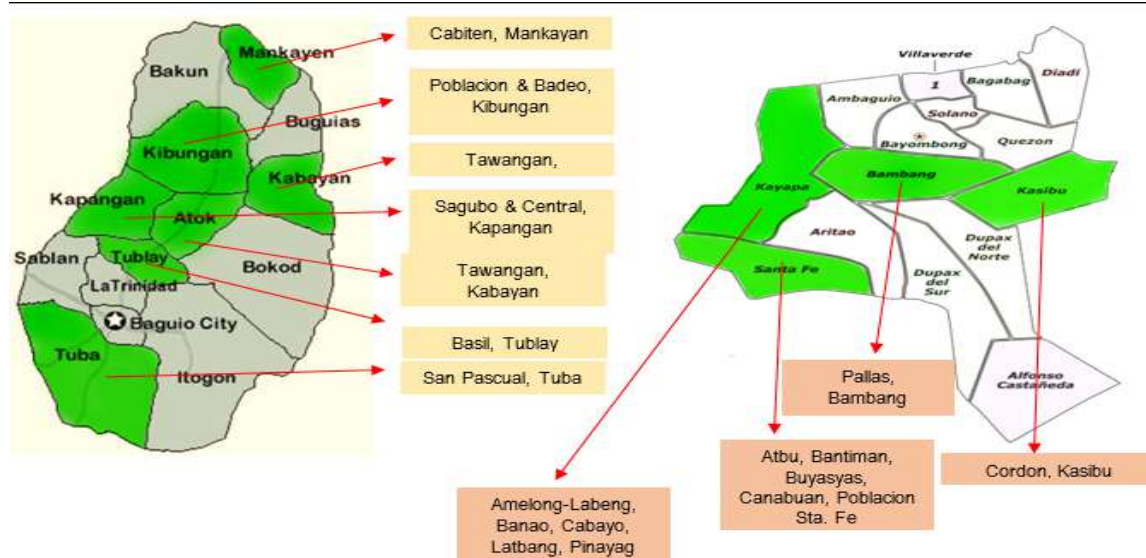


Figure 1. Study sites in Benguet and Nueva Vizcaya.



FINDINGS

Severity and Incidence of Sweetpotato Fusarium Wilt

Stem rot or fusarium wilt of sweetpotato (*Ipomoea batatas* (L.) Lam). is an important disease caused by the fungus *Fusarium oxysporum* f. sp. *batatas*. The fungus is soil-borne specific to sweetpotato and can survive in the soil and in debris for several years. Initial symptoms on sweet potato are yellowing of the lower, older leaves during the rapid growth stage leading to growth retardation, falling off of leaves and stems/vines and eventually death of the plant. Farmers' description is that plant base becomes black, leaves turn yellow until plant dies.

Sweetpotato growers in Kapangan, Kibungan and Tublay in Benguet; and Kayapa and Santa Fe in Nueva Viscaya estimated a higher percentage of SPFW incidence. More sweetpotato growers (54%) especially in Kapangan, Kibungan and Tublay in Benguet (Figure 2); and Kayapa and Santa Fe in Nueva Vizcaya (Figure 3), estimated a higher percentage incidence of sweet potato fusarium wilt. Consequently, majority of growers (55%) in Benguet (Figure 4

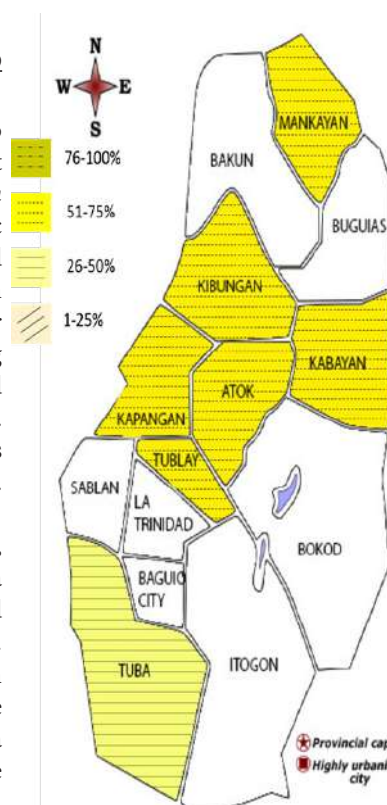


Figure 2. Incidence of SPFW in Benguet

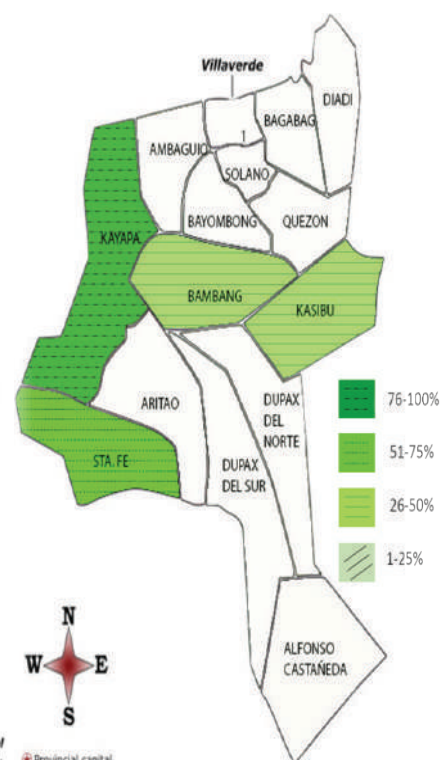


Figure 3. Incidence of SPFW in Nueva Viscaya

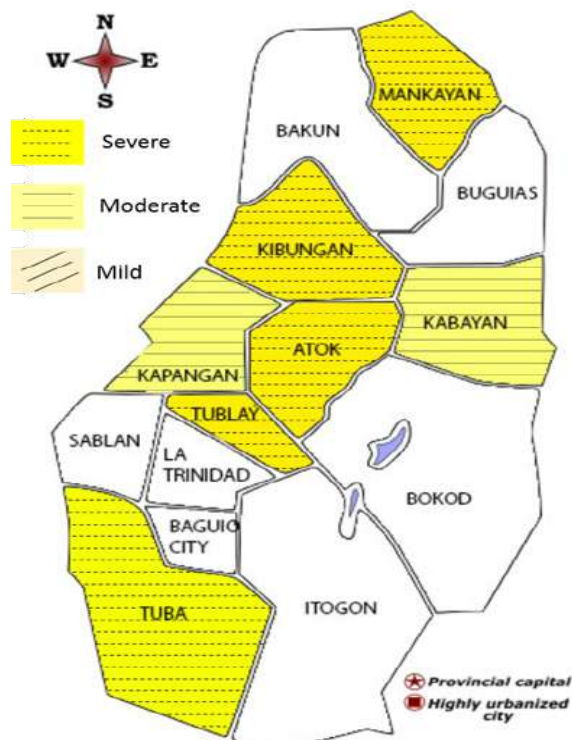


Figure 4. Severity of SPFW in Benguet

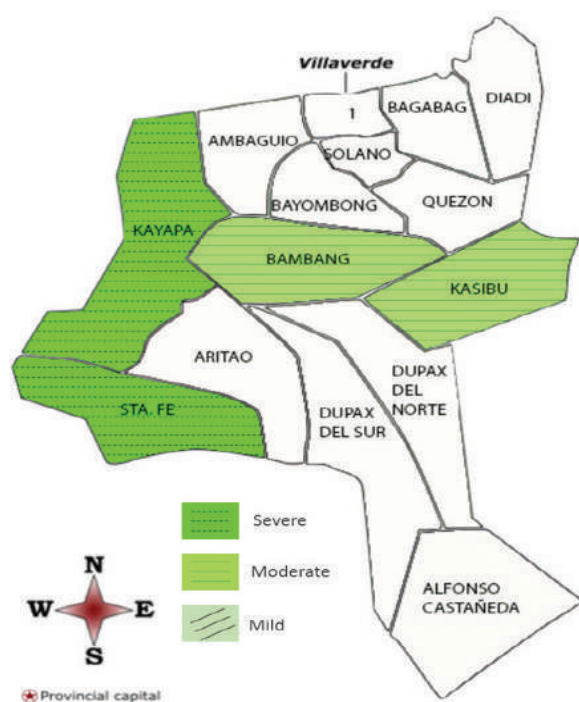


Figure 5. Severity of SPFW in Nueva Viscaya

and Table 1) rated severity of the disease as severe based on percentage decrease in root yield that ranged from 76 -100%. In Nueva Viscaya, 39% rated severity as moderate and only 6% rated severity as mild where decrease in root yield is 25% and below (Figure 5 and Table 2). Percent incidence and severity highly differed among growers in different municipalities.

Effect of Clean Planting Materials

Farmers use vine cuttings as planting materials. Keeping of farm-saved planting materials is still the predominant practice. Indigenous growers who plant sweetpotato in small

areas very seldom purchase planting materials. Even with the occurrence of the SPFW, most of the farmers used planting materials from their existing crops. Results of the study showed moderate association of the source of planting material and disease severity at a contingency coefficient of 0.458 before and 0.457 after the SPFW incidences. This result implies that planting material is a major aggravating factor of the disease.

The use of clean planting materials effectively delayed the incidence of SPFW, which was positively identified as the causal agent that almost wiped out the sweetpotato crop of the upland farmers of Kayapa, Nueva Vizcaya. The application of lime at the rate of 4t/ha, powdered bleach and trichoderma likewise demonstrated a good control against the disease. These interventions resulted to an increase in root yield.

Table 1. Incidence & Severity of SP Fusarium Wilt in Benguet

Municipality	Incidence		Severity**	
	Mean	Descriptive Equivalent	Mean	Descriptive Equivalent
Atok	3	51-75%	3	Severe
Kabayan	3	51-75%	2	Moderate
Kapangan	3	51-75%	2	Moderate
Kibungan	3	51-75%	3	Severe
Mankayan	3	51-75%	3	Severe
Tuba	2	26-50%	3	Severe
Tublay	3	51-75%	3	Severe

**Scale of Severity: 1-2 Mild (75%...)
3 Moderate (40-60%...)
4 Severe (at least 25%...)

Table 2. Incidence & Severity of SP Fusarium Wilt in Nueva Viscaya

Municipality	Incidence		Severity**	
	Mean	Descriptive Equivalent	Mean	Descriptive Equivalent
Bambang	2	26-50%	2	Moderate
Kasibu	2	26-50%	2	Moderate
Kayapa	4	76-100%	3	Severe
Sta. Fe	3	51-75%	3	Severe

Monitoring and Evaluation

The study has shown the essential role of LGUs in pest and evaluation. Enforcing is essential in monitoring and evaluation to support the *Bantay Peste* Program of the government. *Bantay Peste* is a pest and disease surveillance where there will be regular monitoring on the population dynamics of pests. Monitoring and evaluation will be done by the Department of Agriculture (DA) in partnership with the Local Government Units (LGU). The LGUs will monitor their own respective areas and record their observation in a data checklist which will be evaluated by agricultural technicians. Evaluation and assessment can also be done with the help of research institutions to make necessary measures to address the problem. The LGUs will be responsible in the preparation of regular and timely report which will indicate the presence or absence of pests.



CALL TO ACTION

- ✓ Farmers need to avoid using farm-saved planting materials, especially in SPFW-severely affected areas, as these materials are sources of latent infection.
- ✓ Agricultural extension workers and other stakeholders may promote vigorously the use of clean planting materials to sustain sweetpotato production. LGUs may establish community-based nurseries in partnership with local farmer associations.
- ✓ LGUs and other extension delivery agencies may set-up demonstration farms on the use of clean planting materials, coupled with other mitigating measures, in areas severely affected by SPWF.
- ✓ Research institutions should conduct more researches on resistant or tolerant varieties, especially in relation to sweetpotato fusarium wilt.
- ✓ Activate the *BANTAY PESTE PROGRAM* of the government at the municipal level for systematic monitoring.
- ✓ Intensify the DA extension programs on integrated pest management for sweetpotato in partnership with LGUs.



MAJOR REFERENCES

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ABOUT THE MATERIAL

Informing Policy and Practice is published quarterly by the Institute of Social Research and Development and R & E Publications Office of Benguet State University. It synthesizes findings from research and development activities, or presents results of quick survey and opinion poll on social, economic and policy issues and concerns affecting the Cordillera region. It also distills key messages and provides recommendations for the information and consideration of relevant stakeholders and policymakers.

Institute of Social Research and Development
Research and Extension Publication Office
 Benguet State University
 2601 La Trinidad, Benguet, Philippines
 em@il Address: isrd@bsu.edu.ph | repo@bsu.edu.ph
 Telephone/Fax: +63 (074) 422-1877



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