

SITUATION ANALYSIS OF POTATO INSECT PESTS AND TECHNOLOGIES, INNOVATIONS AND MANAGEMENT PRACTICES (TIMPS IN NYANDARUA COUNTY, KENYA

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Introduction

Nyandarua county is a major producer of ware potatoes in Kenya. Being recognized as a major staple food in the country, researchers and crop protectionists in particular would have a keen interest in making a positive contribution towards management of potato pests, by way of bridging the existing knowledge gap as far as positive identification and proper management of such pests is concerned. This would go a long way in helping farmers realize better yields for both domestic consumption and financial empowerment.

Potato pest infestation normally result into high yield losses both in the field and during storage which could be due to a knowledge gap among potato farmers on pest control. This usually leads to misuse of pesticides posing dangers to the environment, to humans and other beneficial organisms. There is an urgent need to address this knowledge gap and it is for this reason that NPCK in partnership with the University of Nairobi through the KCSAP project conducted a field survey that helped in providing an understanding of potato pest of economic importance in Nyandarua County. The understanding of potato pests in the county will help in determining the best pest management approach through establishment of validation trials with two farmer groups.

Objectives of the appraisal

The following objectives guided the appraisal

- i. To establish the level of pest infestation in Nyandarua County
- ii. To establish the stages at which crop is affected
- iii. To establish pest management measures used by farmers in the county

Scope of the Appraisal

The appraisal involved a checklist on the various varieties farmers grow, estimated acreage for each variety, source of planting seeds, most common potato pests and the most common pest control measures for each pest..

The rapid appraisal was informal and targeted representatives from the County department of Agriculture and farmers in Kinangop and Olkalau Sub-counties. Four Ministry of Agriculture Officials and five farmers from two sub counties, Ol Kalou and Kinangop, were involved in doing the questionnaire It was conducted between 28th September and 2nd October 2020. The pests that were under scrutiny in the survey were Potato Tuber Moth, Cut worms, Red spider mite and

Whiteflies. A total of 6 farmers and 4 officials from sub county agricultural offices were interviewed as shown in table 1 below

Table 1. List of interviewed farmers and agriculture officials

No.	Name	Farmer group/institution	Sub-county
1.	Robert Mwaniki	SCAO	Kinangop
2.	Joseph Njogu	WAO	Kinangop
3.	Joseph Kimotho	SCAO	Olkalau
4.	Boniface Kamaru	WAO	Olkalau
5.	James Githua	Farmer	Kinangop
6.	Julia Wangari	Farmer	Kinangop
7.	Monica Wanjiru	Farmer	Kinangop
8.	Barnabas	Farmer	Olkalau
9.	Paul Thuo	Farmer	Olkalau
10.	Joyce Ngugi	Farmer	Olkalau

Results of the appraisal

Potato production

i). Varieties grown

Shangi is the most common in the two sub-counties while the rest have been introduced by potato projects done by county government in conjunction with development partners.

Table 2. Common varieties in Kinangop and Olkalau

No.	Kinangop	Olkalau
1.	Shangi	Shangi
2.	Dutch Robjin	Dutch Robjin
3.	Unica	Markies
4.	Panamera	Jelly
5.	Sherekea	Destiny
6.	Markies	Voyager
7.	Taurus	Kenya Mpya
8.	Desiree	Unica

ii. Area under potato production

The estimated area under potato in Kinangop is 85,000 ha for 3 seasons in a year while in Olkalau the estimated area is 6000 ha. There is no data for area covered by each variety but shangi takes approximately 98% of the total area under potato production.

iii. Source of seeds

Out of the six farmers interviewed 5 are using farmer saved seeds while one is using certified seeds. Extension officers from both sub-counties indicated that about 98% of the farmers from the two Sub-counties use farmer saved seeds.

iv. Problems farmers face when sourcing the different seed varieties

Shangi is the most common variety among farmers however availability of certified Shangi seeds is a major challenge. This is because; the amount of certified shangi seeds being produced does not meet the farmers demand, certified seeds are expensive and the seed producers' are far away from the County. The other seed varieties are readily available but not common among farmers due to lack of a ready market for their ware potato.

Potato pests

i. Most common potato pests

The following are most common pests in order of importance and part of the crop mostly affected.

Table 3. List of common pests in Kinangop and olkalau

No.	Kinangop	Olkalau
1.	Aphids-leaves	Cut worms-leaves and stem
2.	Thrips-leaves	Tuber moth-tuber
3.	Cutworms-leaves and stem	Whitefly-leaves
4.	Tuber Moth-tuber	Aphids-leaves

Other pests

1. Millipedes –potato tuber
2. Slug(in Olkalau)-Destroys potato tubers
3. Red spider mites

PCN is a major problem in the two sub-counties

In Ol Kalou sub county, Kanjwiri ward, the pests mentioned , in order of importance were

cut worms, potato tuber moth, white flies, aphids. The Tuber moth damage is noticed in storage while the other three attack the stems and leaves.

ii. Identification of pests

Majority of the farmers examine the crop leaves for aphids and thrips

Pest control measures used

- i. Common agrochemicals bought by farmers*

Farmers in Kinangop use the following;

1. Thunder from Bayer EA-All pests
2. Buffalo from Amiran-All pests
3. Rabbit Urine made locally- All pests
4. Concoction of stinging nettle –All pests
5. Alfacyper from murphy chemical to control Aphids,whiteflies,thrips

Farmers in Olkalau use the following;

1. Thunder from Bayer
2. Tihan from Bayer
3. Alfacyper from Murphy chemicals

The control measures are effective in most cases.

ii. Cost of the common Agrochemicals used

The pesticide cost is per pump and 1 acre will require approximately 7 pumps. Application could be done 3 times or more within a season. One acre will require 4litres of rabbit urine.

Table 4. List of common pesticides in Kinangop and Olkalau

Pesticide	Quantity	Cost in Kes.
Thunder	20 litres pump	100
Buffalo	5 pumps	500
Rabbit Urine	1 litre	100
Tihan	50mls	450
Alfacyper	5mls	150

iii. How different potato varieties are affected by pests

According to majority of the respondents in the two sub-counties Dutch Robjin potato variety is the most affected by pests followed by destiny while Shanghi is the least affected.

Quality of inputs and source of information

i. Quality, availability and prices of inputs

Most of the farmers have no problem with the quality, availability and prices since they are not aware of specific agrochemicals required to control the specific pests.

ii. Common source of production and marketing information

The common sources of information regarding potato production and marketing include;

1. Extension officers
2. NGO'S (IFDC, NPCK, Hand in Hand, Care Kenya & GIZ)

iii. Percentage of farmers accessed to smart phones

About 50% of farmers drawn from the two farmer groups in Kinangop and Olkalau have smart phones

iv. Common local FM stations

Inooro FM is the most common followed by Kameme FM. They normally listen to a programme called Sauti ya mkulima in Inooro FM.

Credit and information

The following was cited by farmers during the survey

- ✓ Stockists sometimes offer inputs to farmers on credit
- ✓ The terms being a farmer taking farm produce equivalent to the price of inputs
- ✓ Farmers do not get advice on how to use the agrochemicals

Conclusion

During the survey it was observed that most farmers do not know how to differentiate pest and diseases damage hence they were unable to tell the percentage damage caused by specific pests on the potato crop.

Farm demonstration trials will be set with two farmer groups in Kinangop and Olkalau having a demo plot size of half an acre each.

CHECKLIST

This reconnaissance survey seeks to provide an understanding of potato pest of economic importance in Nyandarua county, establishing the level of infestation in the county, determine the stage at which the crop is affected and the extent of pest damage to potatoes at different stages. The survey also seeks to establish the pest management measures used by farmers in the county. The understanding of potato pests in the county will help determine the best pest management approach and be able to establish validation trials. The rapid appraisal will be informal and will target key informers, stakeholders and a few farmers in the County. Listed below are a few topics under which common questions revolving around who, where, when, how, for how long, how much and why are framed.

Groups of people to be interviewed

- A. MOA of the county government _____
- B. Farmers/ Opinion leaders _____

A. Ministry of Agriculture/ farmer/ opinion leader

Name _____ of _____ the _____ respondent _____ Sub-
county _____ Ward _____

Potato production

1. What different varieties are grown in each sub-county?
 2. What is the estimate of area under each variety grown in each sub-county?
 3. From where do farmers get seeds?
 4. What problems do farmers face with different varieties when:
 - 1.
 - 2.
 - 3.
 - 4.
- a. Sourcing for seed
 - b. Harvesting
 - c. Storing

- d. Marketing
- e. Others (specify)_____

5. What are the most common potato pests in each sub county?

6. What are the most commonly used insect control measures for each type of potato pest in each sub county?

Potato pest

1. What are the most common potato pests in the subcounty?

a. If more than one, list them in order of importance (i.e. starting with the most common and destructive)

b. How do farmers identify each pest?

c. Provide details for each pest in the format below:

ii. Name of Potato pest _____

iii. Stage/ part affected by pest _____

iv. Type of damage caused by pest _____

v. Control measures used _____

d. How do farmers determine the time to use the above-mentioned insect pest control measure?

e. If spraying is used, how many times _____

vi. Effectiveness of each insect control measures _____

vii. Percentage loss caused by the insect pest _____

2. Are some varieties affected by potato insect pests more than the others?

a. If yes, explain

Quality of inputs and source of information

1. Do farmers have problem in quality, availability and prices of the following inputs?

a. Pesticides (insecticides)

- i. If yes, give details of the insecticide agro-inputs and problems?
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2. Which is the most common source of production and marketing information?
3. What percentage of farmers has access to smart phone?
4. Which are the two most common local FM radios (rank the two)?
5. Are some varieties affected by potato pests more than the others?
 - a. If yes, explain

Agro-chemicals

1. What are the common pest agrochemicals bought by potato farmers?
2. Which are the most commonly purchased agrochemicals for controlling pests and which pests do they control and what is their prices?
3. What are the common farmer complaints about the Agro-chemicals they buy?

Credit and information

1. Do stockists offer inputs to farmers on credit?
 - a. If yes what are the terms?
2. Do stockists advise farmers on how to use agrochemicals?
 - a. If yes, what advice and from where did they acquire the knowledge from?
3. What are the problems faced by stockists when serving potato farmers?