



# Using urine and ash to control crop pests and diseases

<b>Source</b>	Grameen Foundation
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<b>Country of first practice</b>	Uganda
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<b>Sustainable Development Goals</b>	No poverty and life on the land

## Summary

This practice describes how urine and ash can be used to control crop pests and diseases in Uganda.

## Description

All materials are readily available on the farm and no cash expenditure is involved.

### 1. Preparation

Farmers use different preparation procedures for different crops, pests and diseases. Dilution and storage of urine are two key steps that a farmer needs to keep note of when using this practice. However, urine can also be used with or without dilution.

#### 1.1 Dilution

Dilution is done to reduce the concentration of nitrogenous compounds in the urine that could burn the young plant tissues. Farmers have invented different dilution levels for different crops and application techniques. The dilution levels vary between approximately 2:1 (2 parts urine to 1 part water) to 1:4 (one part urine to 4 parts water). A dilution level of 1:1 (one part of urine to one part of water) was found to be the most common practice among the farmers met by members of Grameen Foundation Community Knowledge Worker network in Uganda.

#### 1.2 Storage

In most preparations, farmers store urine for varying durations ranging from one day to three weeks before or after adding other ingredients. Storing urine is important to reduce the risk of spreading diseases caused by microorganisms that may be in the urine (see recommendations in chapter “Health concerns”).

It is important to note that diluting the urine before storage lowers its concentration and therefore increases the chances of survival of microorganisms. Whether stored before or after adding other ingredients, urine must be stored in closed containers to avoid loss of ammonia and entry of pathogens.

Diluted urine if kept open would also act as a breeding place for mosquitoes. Urine should also be kept out of reach of children and domestic animals to reduce chances of disease spread.

#### 1.3 Filtering

Before application, the ash and urine preparation may need to be filtered depending on the application procedure to be used. When using a spraying pump, the mixture should be passed through a porous



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bucket to remove big ash particles and then later through a fine filter or mesh cloth that will allow only the liquid to pass through. This is to avoid blocking the nozzle of the spraying pump and depositing ash particles on harvestable plant parts.

The residue obtained after filtering can be incorporated in the soil around the plants as it is rich in nutrients like potassium and nitrogen.

## 2. Areas of application

This practice has been applied successfully by farmers from Masindi, Kapchorwa, Mukono, Buikwe and Nwoya districts.

Masindi district is located in Western Uganda. The district lies in a mid-altitude region experiencing a bimodal rainfall pattern. It is an area of high agriculture potential growing both seasonal and perennial crops the major ones being finger millet, cassava, sorghum, bean, maize, banana, coffee, sunflower and a wide range of vegetable like tomatoes, water melon, onions and cabbage.

Kapchorwa district is located in Eastern Uganda and lies in high altitude regions experiencing a bimodal rainfall pattern and cold conditions in most season of the year. Kapchorwa is one area where agriculture is fairly commercialized due to the highly fertile soils and all year round favourable climate.

Major crop grown in the area include Arabica coffee, banana, maize, bean, wheat, millet, rice, barley, potato, tomato, cabbage, passion fruit and onions.

Mukono and Buikwe districts are located in Central Uganda. The districts are located in the Lake Victoria region with Buikwe being bordered by the lake. Owing to the good climate, weather and location close to Kampala, the major business centre

in the country, agriculture in this area is fairly commercialized with a wide range of seasonal and perennial crops. The major crops in the area include banana, Robusta coffee, maize, beans, cassava, sweet potato, fruit trees, vegetable including, tomato and cabbage.

Nwoya district is located in northern Uganda in a more-less dry region. Due to the climate of the area, it is dominated by seasonal crops the major ones including Maize, Cotton, tobacco, simsim (sesame), finger millet, sorghum, Beans, cassava and sunflower.

### 2.1 Important notes

- The preparation and application procedures described above are according to the farmer's practices. It is important that when any of the above practices is applied in a new environment or on a new crop, a test be conducted on a few plants and observe for at least a day before large scale application is done.
- Applying too much urine can burn the plant. This can be very common when undiluted urine is used during the dry season or applied on young plant tissues. To avoid this, an interval of at least one week should be left between subsequent applications of undiluted urine preparations especially during the dry season.
- In case the problem in question is not solved by a single application, the farmer may apply subsequent applications. Care should be taken to ensure that the urine applied is not excessive to burn the plant. (see note 2 above).
- When spraying these preparations, it is important to ensure thorough wetting of the plant especially the infested parts. Extra attention should be given to the lower leaf surfaces since these are a



hiding place for most pest.

- When spraying these preparations, it is important to ensure thorough wetting of the plant especially the infested parts. Extra attention should be given to the lower leaf surfaces since these are a hiding place for most pest.
- Because urine is a mixture of different salts, its continuous application especially in dry areas or during the dry season may lead to accumulation of these salts in the plant root zone. To avoid this, urine application in arid areas or during the dry season should be followed by application of plain water to dilute the salts. During the rainy season, allowing one rain between two subsequent applications is advised.
- Complementing these preparations with different insect repellent plants such as Mexican marigold, onions, pepper may increase their effectiveness. Farmers may try adding different types and quantities of these plants and apply which ever works well in their environment.

## 2.2 Other advantages of urine and ash to plants

Urine and ash are rich in several plant nutrients. Urine is specifically a rich nitrogen source while ash is a rich potassium source. Both of these nutrients are important for proper plant growth. On top of preventing/controlling pests and diseases, applying this preparation helps to boost soil fertility. The improved plant vigor as a result of the improved soil fertility to some extent explains the action of this concoction.

## 2.3 Health concerns

Urine especially if collected from humans can be a source of diseases such as Schistosomiasis and typhoid. Storing the

urine for at least one week reduces the risk of disease spread.

To reduce this risk further, the following safety precautions should be taken when handling and using urine preparations:

- wear rubber gloves when handling urine;
- wash hands and all equipment used with soap and water after handling urine;
- when using human urine, observe a one month withdraw period from the time of last application to harvesting; if urine is applied on the harvestable parts;
- all urine should be stored in covered containers out of reach of children and domestic animals;
- never pour urine or water used to wash its containers in streams, swamps and other water sources; and
- use of human urine collected from different household or public places should be avoided as much as possible since this can increase the risk of disease transmission.

## 2.4 Areas of further research

There is need for scientific experimentation on these concoctions to come up with the most effective application rates and possibility of using the idea to a wide range of crops.

## 4. Acknowledgment

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- Emmanuel Anguyo, author of the idea;
- Grameen Foundation Community Knowledge Worker network; and
- TECA Uganda exchange group.

## 5. Validation of the practice

This practice has been applied successfully by farmers from Masindi, Kapchorwa, Mukono, Buikwe and Nwoya districts in Uganda.



Table 1: Preparation and application of urine and ash preparations by farmers in Uganda

Purpose	Preparation procedure	Application procedure	Area of application
<b>Controlling aphids on passion fruit</b>	Keep urine in a covered container under shade for 3 days; add one half litre cup for every 2 litres of urine and keep the mixture covered for 3 more days. Filter well before application.	Spray the mixture on infested plant parts as soon as the pest is seen. Repeat the application after 14 days.	Masindi district in western Uganda
<b>Preventing groundnut blight</b>	Keep urine in a covered container under shade for 3 days; add one half litre cup for every 2 litres of urine and keep the mixture covered for 3 more days. Filter well before application.	Spray the crop 14 days after germination and a second spray 28 days from the first spray.	Masindi district, western Uganda
<b>Preventing maize stalk borers</b>	Keep urine in a covered container under shade for 3 days; add one half litre cup for every 2 litres of urine and keep the mixture covered for 3 more days. Filter well before application.	Spray the maize 4 to 6 weeks after planting. Repeat the application every 7 to 14 days.	Masindi district, western Uganda
<b>General pest prevention in potatoes and beans</b>	Keep urine in a covered container under shade for 3 days; add one half litre cup of ash for every 2 litres of urine and keep the mixture covered for 3 more days. Filter well before application.	Spray when expecting pest attack especially during the dry season.	Masindi district, western Uganda
<b>Controlling banana weevils</b>	Keep urine in a covered container for two weeks; add one half litre cup of ash for every 1.5 to 2 litres of urine. Shake the mixture well before application to ensure that the ash is uniformly mixed in the urine.	Sprinkle two litres of the mixture on the infested banana stool. Repeat the application every two weeks until no more pests or its symptoms are observed.	Mukono and Buikwe districts in Central Uganda and Kapchorwa district in Eastern Uganda
<b>Controlling coffee leaf rust</b>	Store urine in a covered container for two weeks, add one half litre cup of ash for every two litres of urine and continue storing the mixture for another two weeks. Filter the mixture well before use.	Spray the mixture on the coffee plant as soon as the disease symptoms are observed.	Kapchorwa district
<b>Controlling aphids on oranges and jack fruit</b>	Add 20 table spoons of ash to one litre of urine. This preparation does not foresee to be stored. Filter the mixture well before spraying.	Spray the mixture on the crop twice a week. This mixture can also prevent animals like goats from eating the crop if their urine is used.	Nwoya district
<b>Controlling mealy bugs on jackfruit</b>	Store urine in a covered container for two weeks; add one half litre cup of ash to one litre of urine and dilute the mixture with one litre of water. Filter the mixture well before use	Spray the mixture on the infested plant. A single application can be enough to control the pests. The application should be repeated if a new attack by the same pest occurs.	Nwoya district

Source: Grameen Foundation 2017

## 6. Objectives fulfilled by the project

- Pro-poor technology

This practice does not require any investment. Poor farmers can apply it using their in-farm resources.