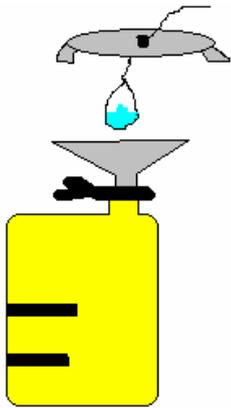
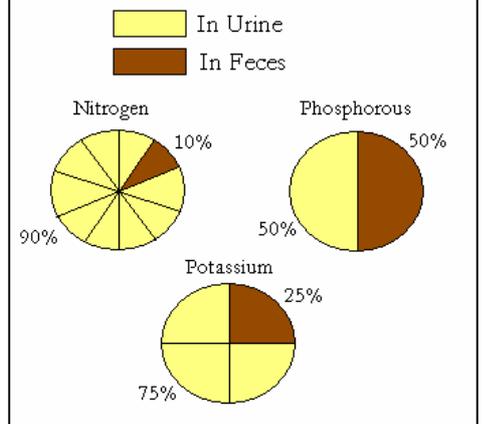


STARTING TO USE URINE AS FERTILIZER

People have used animal and human feces to fertilize crops for centuries because manure contains many vitamins that plants need. What most people don't know is that the majority of beneficial nutrients leave human and animal bodies through urine rather than through feces, and the majority of urine is pathogen-free. People in the developed and developing world are beginning to use this untapped nutrient potential to fertilize crops with great success. It's currently being tried all over West Africa. This paper will teach you how to collect urine in modified jug and turn it into fertilizer in a safe and cheap manner.

Proportions of Nutrients Leaving the Body:

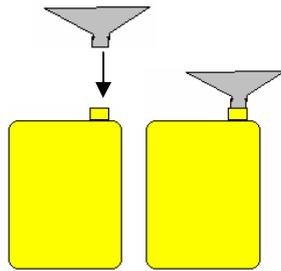


The Urine Collector

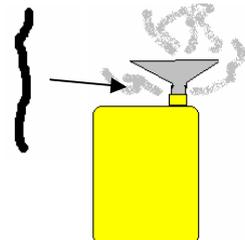
We can't apply urine directly on plants because it's too acidic and will burn our plant roots. We need to collect the urine and dilute it.

Start by getting a 20 L yellow jug (not green because we need to see the liquid level inside). Costs 400-750 CFA

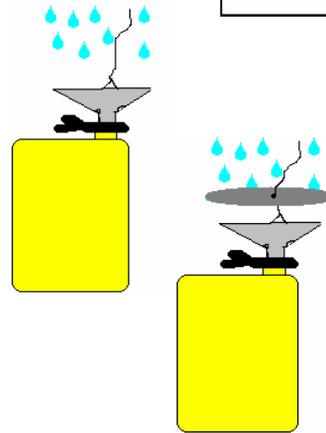
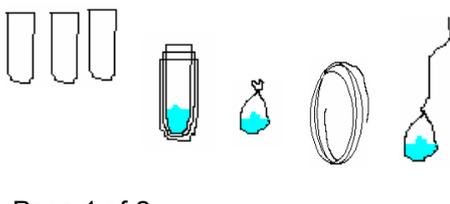
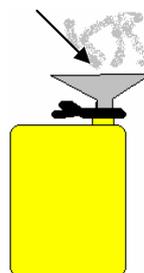
Buy a large mouth funnel that can fit tightly into the jug opening. The stainless steel funnels made locally are best. If possible, have the funnel maker add a screen to block debris from falling in. Costs 500-750 CFA



We need to make the jug air-tight. Otherwise it's going to stink, and that stink will mean a lot of precious nitrogen is leaving as ammonia. First, we tie a piece of rubber cord where the jug and the funnel meet to seal any air gaps. Costs 0-100 CFA

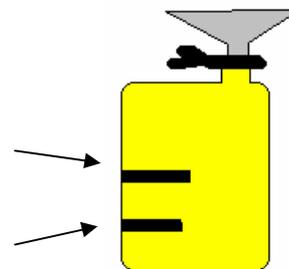


Next, we're going to make a seal for the mouth of the funnel. Put 3 or 4 old plastic bags one inside the other and fill the inner most bag part way with water. Push the air out and tie the bags up top. Now tie it to a string. Costs 0-50 CFA



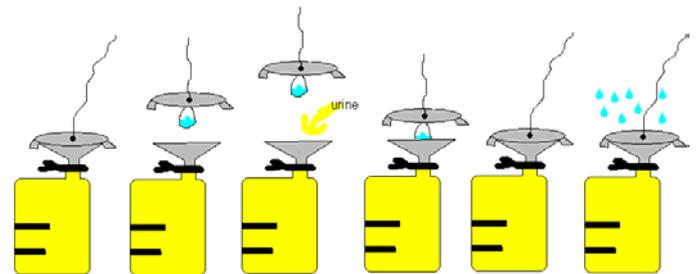
If your latrine doesn't have a roof, you need a cover to keep rain out during the wet season to avoid over-diluting the nutrients in the urine. You can use anything that can sit over the funnel. Put a small hole in the middle and loop your string through. Costs 0-250 CFA

Ask the funnel makers if they can make a nice cover like this out of sheet metal. Ours did for 250 CFA.



Now draw a line half way up the jug and a line a quarter of the way up. This is for our dilution of 1 part urine, 3 parts water.

Tada! A beautiful jug ready to collect urine. The rope is attached to the latrine wall. When you want to add urine to the jug, pull the rope up. The bag and cover will rise. Add urine and place the cover once more. The jug is now airtight and rain proof.

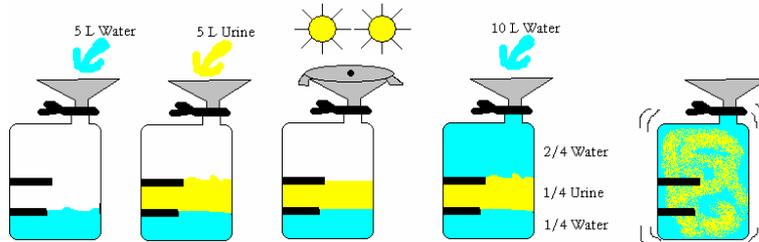


NOTE: Women and small children can add urine to the funnel using a cup. Sit a cup or old can in the latrine. People can urinate into the cup and dump it into the collector afterwards.

Collecting and Diluting Urine

We want our fertilizer to be 1 part urine, 3 parts water: That means we need 5 liters of our 20 liter jug to be urine. Here's what we do:

1. Fill the jug to the first line with water. Now 1/4 of our jug (5 L) is water
 2. Add **ONLY URINE** until the jug is half full. This will take 4 or 5 days.
 3. Once jug is half full, **STOP** adding urine. Now 1/4 the jug (5 L) is urine.
 4. Set the jug aside for 2 days. This will kill any schistosomiasis in the jug.
 5. Take the jug to your chosen crops.
 6. Now fill the jug the top half of the jug with water and mix.
- The jug is now 1/4 urine (5 L) and 3/4 water (15 L) and ready to fertilize.



A Note on Diseases

Only diseases of the urinary tract are transferred through urine. The most common is schistosomiasis, which we kill during collection. Other urinary tract infections are rarely spread through contact with urine, but to be safe, it is best that anyone with painful urination or blood in their urine be asked to try to refrain from urinating in the collector.

Application Rate

4 Liter of Mixture per 1 Square Meter of Crops each 1 Week

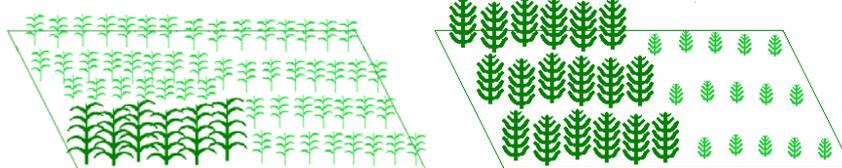
This means our 20 L jug can fertilize 5 square meters of crops each week.

NOTE: This is strong dose that will produce a visible increase in most crops. Once people are convinced the urine fertilizer works, we can use more efficient nutrient application rates for specific crops.

Prepare an Application Area

We want to see that there is a difference when urine is used, so it is best to choose an area we can split. We put urine fertilizer on one portion and none on the other. We'll be able to see the difference with urine and non-urine crops next to each other. Use sticks to mark off an area of 5 square meters for each 20 liter jug.

With field crops, choose a small section of a larger field and consistently apply the fertilizer to that area.



For garden plots, split each in half and fertilize the same half with urine each week.

When to Apply

START APPLYING URINE 2 weeks after sowing. Early on, a seed has so many vitamins that it doesn't need extra fertilizer nutrients. In fact, too many vitamins in the first two weeks can stunt growth later.

STOP APPLYING URINE 3 weeks before harvest. Old plants cannot use extra vitamins efficiently, so the urine is best used elsewhere or saved for later use. This also adds a level of precaution against any microbes that may have been in the mixture. Most microbes in urine have been found to die off in 3 weeks.

How to Apply Urine

We need 4 L of urine to water 1 square meter of crops. Note that this 4 L of mixture contains 1 L of pure urine.

$$\begin{array}{rcl}
 1 \text{ Part Urine} & & 1 \text{ Liter Urine} \\
 + & = & + \\
 3 \text{ Parts Water} & & 3 \text{ Liters Water} \\
 \hline
 & = & 4 \text{ Liters of Mix}
 \end{array}$$

- Find something to measure out the 4 L of mix.
- Pour the fertilizer near the ground to prevent urine on leaves
- Apply the 4 L of mix evenly over the chosen square meter
- Wait until just after the fertilizer seeps into the ground (less than 1 minute) and water the area. Remember how nitrogen likes to escape? This pushes it into the ground so it stays.

What to Fertilize with Urine

BAD FOR: Carrots, because it will grow big leaves and small roots.

LITTLE EFFECT ON: Legumes, Beans, and Peanuts, because they fix nitrogen.

BEST ON: Corn, Millet; Sorghum, Salads, Spinach, and other Greens because urine fertilizer is great for growing bigger leaves and lots of seeds.

GREAT ON: Everything else (Onions, Tomatoes, Potatoes, Eggplant, Bananas, Peppers, Garlic, Cucumber, Melons, Squash, Sweet Potatoes, Cassava...)