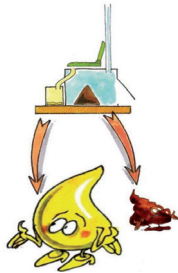


# How to separate urine?



Urine diverting toilets do not mix urine and faeces. Urine is collected and stored in a reservoir. Faeces are collected underneath the toilet which must be then covered by dry materials such as saw dust, soil or ashes or a mixture of those, and stored for 2 years.

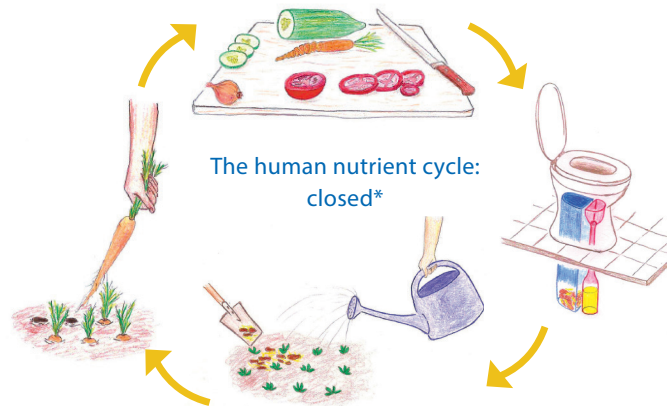
Why should we mix what nature has separated?



**Hygiene:** Urine is generally free of pathogens when excreted by a healthy person. However, there might occur some pathogenic contamination, thus urine should not be applied directly onto parts of plants to be harvested and eaten raw. Urine from public toilets should be stored for 6 months, while from private toilets urine can be used directly.

**References:**

World Health Organisation, 2006: WHO Guidelines for the safe use of wastewater, excreta and grey water, Volume 4, Use of excreta and grey water in agriculture [http://www.who.int/water\\_sanitation\\_health/wastewater/gsuww/en/index.html](http://www.who.int/water_sanitation_health/wastewater/gsuww/en/index.html)  
 Ecosanres, 2004: Guidelines on the safe use of urine and faeces [http://www.ecosanres.org/pdf\\_files/ESR\\_Publications\\_2004/ESR1web.pdf](http://www.ecosanres.org/pdf_files/ESR_Publications_2004/ESR1web.pdf)  
[http://www.ecosanres.org/pdf\\_files/ESR\\_Publications\\_2004/ESR2web.pdf](http://www.ecosanres.org/pdf_files/ESR_Publications_2004/ESR2web.pdf)



Ecological sanitation does not waste resources, does not pollute the environment and closes the Loop of Nutrients (not like pit latrines or flush toilets without treatment). Urine contains most (80—90%) of the nitrogen excreted.

*\* for the re-use of faeces see separate flyer "Compost and safe re-use of faeces"*

Women in Europe for a Common Future (WECF)

Rural Communities Development Agency (RCDA)

Contact person:  
 Claudia Wendland  
 claudia.wendland@wecf.eu  
 WECF The Netherlands  
 PO Box 13047  
 3507 LA, Utrecht  
 The Netherlands  
 Tel: +31 - 30 - 23 10 300  
 Fax: +31 - 30 - 23 40 878

Mtskheta Municipality,  
 Village Misaktsieli.  
 Tel: +995 593 17 17 72  
 e-mail: rcda@rcda.ge  
 www.rcda.ge



RURAL COMMUNITIES DEVELOPMENT AGENCY



Ministry of Foreign Affairs of the Netherlands



# Urine – the yellow gold

Safe re-use of human urine from ecosan toilets to increase your yields



Women in Europe for a Common Future | WECF

# Why to fertilise with urine?

Urine is an excellent fertiliser containing nitrogen, phosphorus, potassium and many micro-nutrients.

The nutrients in urine are easily taken up by plants. The fertilised plant will grow faster, develop more leaves and produce higher yields.

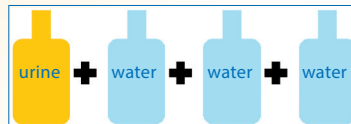
Applying urine to crops instead of chemical fertilisers saves money and energy and produces a similar yield. One person produces about 500 liter urine per year.



How urine application improves the yield

# How to apply urine?

**Dilution:** Undiluted urine is quite 'strong', and should be diluted with water in order not to 'burn' the plants. However, on bare ground before planting, urine can be applied undiluted. When fertilising young plants, urine should be diluted 1:1—1:7. For young plants you need to dilute the urine more than for elder or for trees.



**How much?** As a rule of thumb it is recommended to apply 1.0-2.5 liter urine per square meter, depending on the nitrogen demand of the crop and soil. You can do small experiments to find the optimal fertilisation.

|            | Per Litre | Per person/year |
|------------|-----------|-----------------|
| Nitrogen   | 3-7 g     | 2 - 3.5 kg      |
| Phosphorus | 0.3 - 1 g | 0.2 - 0.5 kg    |
| Potassium  | 1.5 - 2 g | 0.8 - 1 kg      |
| Sulphur    | 0.5—1 g   | 0.5 kg          |
| Magnesium  | 30—80 mg  | 40 g            |
| Calcium    | 50—200 mg | 100 g           |

The table shows the nutrient content in urine

**When to fertilise?** Fertilisation with urine can be scheduled as usually done with nitrogen fertilisers, thus during the growing season. Fertilisation can be done once or more in the cropping season. In general, crops with small amount of roots like carrots, onions and lettuce need more repeated applications of urine. In winter urine can be stored in closed containers until the growing season. After fertilisation, the crops can be watered to rinse the urine into the soil to avoid nitrogen loss. Or use urine together with irrigation.



Direct use of urine from private toilets, BUT after 6 months storage for public toilets!



Harvest after 1 month or later



| Do's  | Dont's   |
|---|--|
| <ul style="list-style-type: none"> <li>• Apply the urine close to the ground</li> <li>• Incorporate or rinse the urine in the soil</li> <li>• Wear gloves and old clothes when applying</li> <li>• Wash the crops after harvesting</li> </ul> | <ul style="list-style-type: none"> <li>• Don't apply urine less than one month before harvesting</li> <li>• Don't apply urine next to surface water (rivers or lakes)</li> </ul> |