The fertiliser of the future.

www.vuna.ch

Naturally local for all your plants.

7 good reasons to use Aurin

**Nutritious**
Aurin contains all nutrients required by your plants to grow.

**No heavy metals**
Contrarily to traditional phosphate fertilisers, Aurin does not contain any heavy metals.

**No pharmaceuticals**
The production process removes all pollutants, especially pharmaceuticals.

**Efficient**
Less energy and chemicals consumed to treat wastewater.

**Approved**
Aurin is officially licensed by the Federal Office for Agriculture as a fertiliser for all plants.

**Globally local**
Urine is completely local, anywhere in the world. No import is necessary.

**A fragrant note**
Aurin does not smell like urine.

Closed loop with nutrient recycling

Wastewater Treatment:
- Wastewater treatment plants remove nitrogen and phosphorus using a lot of energy.
- Pharmaceuticals and hormones enter the wastewater stream via urine and reach surface waters due to limited treatment.

Recycling works with:
- Paper
- Metal
- Glass
- PET

Vuna closes the loop and produces Aurin fertiliser from urine.

Separately collected urine provides the highest nutrient yield:

Origin of nutrients in wastewater:
- 1.5 litres of urine per person per day
- Diluted with 150 litres of water per person/day
- 80% from urine
- 50% from urine

Agriculture:
- Phosphate fertilisers contain heavy metals, e.g. cadmium or radioactive uranium.
- 100% of mineral fertilisers are imported.
- 1kg of nitrogen fertiliser requires the energy of 1kg of crude oil.

Nitrogen
- 80% from urine
- Rest diluted with 150 litres of water per person/day

Phosphorus
- 50% from urine
- faeces
- rest

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- 80% from urine
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1kg of nitrogen fertiliser requires the energy of 1kg of crude oil.

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Nutritious and natural fertiliser from urine.
The Vuna Process for an efficient and safe nutrient recycling.

**Collect**
Waterless urinals or urine diverting toilets collect urine: z.B. Laufen save! oder Ecodomeo resp. Sanisphère.

**Stabilise**
The Vuna Process biologically transforms ammonium into nitrate (nitrification).

**Purify**
The activated carbon filter safely eliminates all pharmaceuticals and hormones.

**Concentrate**
The distiller eliminates all pathogens and reduces the liquid volume.

**Fertilise**
The process produces water and Aurin – Vuna’s liquid fertiliser for all plants.

**Fresh urine**
What happens with all substances contained in urine?
- Heavy metals – not present in urine.
- Bad smell & volatile ammonia
- Pharmaceuticals & hormones
- Pathogens
- Primary nutrients (nitrogen, phosphorus, potassium etc.)
- Secondary nutrients (e.g. boron, iron, zinc)

**Implement urine recycling at your place!**

- Permanent urine treatment plants in large buildings: Produce your own fertiliser in your residential or commercial building to close the loop locally.
- On the road and at events with the «Pee-Mobile»: The versatile mobile fertiliser factory with mobile toilets at your eco-friendly event.

**Vuna – your expert for water & sanitation**

- Consulting for decentralized wastewater treatment
  In addition to developing urine treatment plants, Vuna supplies you with a comprehensive and up to date overview of potential sanitation systems. We design, plan, and implement systems that specifically meet your needs, ranging from dry toilets to special water filters.

- «Harvest» – Vuna’s history
  Vuna means «harvest» in isiZulu, the language of the Zulu people. VUNA originated in Durban in 2010, when the municipality was looking for a suitable treatment for large quantities of collected urine. In 2016, the company Vuna Ltd was founded in Zurich as a spin-off of Eawag.

**Some numbers about urine recycling – a sample calculation:**

- 1000 litres of urine generate: appr. 70 litres of Aurin fertiliser
- 2-3 days of treatment: appr. 930 litres of distilled water
- 150 kWh energy consumption: appr. 2000 m² of fertilised soils.

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