

## RESTRICTIONS ON FERTILIZATION PROCEEDING FROM ENVIRONMENTAL REQUIREMENTS

Sanctioned by the Minister of Environment  
(Reg.No.23, 04.07.1994, valid from 01.08.1994)

1. In order to lessen the reach of organic substance and fertilizer compounds into surface- and groundwater, restrictions are set on the number of domestic animals kept (for animal load of the land see table 1), on the use of fertilizers and on farm buildings.

Table 1. *Permitted animal load in Estonia.*

Region	Animal units per hectar of arable land
In general in Estonia	1.5/2*
Karst areas and areas with thin residual soil	1\1.5
Islands and coastal areas impeding the steep limestone shore	1\1

A bigger number is valid if domestic animals are kept only in summer.

One animal unit is equal to 1 milk cow or a horse (500 kg of average weight), 2 young domestic animals or 2 beefcattle, 5 calves, 2 sows with farrows or 6 meat pigs, 100 laying hens or 400 broilers.

If a cattle-breeder has any valid contracts for selling manure to other users (to non-breeding farms etc.) and the manure-storages are sufficiently big, the number of animal units per hectar of arable land could be bigger on a condition, that only a permissible amount of manure is spread on his own land.

The norms are valid beginning from 5 animal units.

2. For the current norms the use of fertilizers means the storing and spreading of manure, liquid manure (slurry), dung water and mineral fertilizers.

3. Every structure of animal husbandry where the number of animals kept exceeds 5 animal units shall have a **manure storage**. Depending on local conditions local authorities may require construction of a manure storage at farmsteads with a smaller number of animals as well.

The manure storage shall be watertight and shall have a roof if possible. Precipitation water shall not drain into the manure storage as well as dung water shall not drain out of the storage. A dung manure storage shall be covered. The storing capacity of a manure storage shall be that of cattle manure for 8 months' period (cattle is mostly pastured in summer) or that of pig dung or guano for 10 months' period. A liquid manure or dung water storage shall have a capacity of 12 months' dung water or liquid manure.

According to the Regulation on the Protection of Coastal Areas no new manure nor mineral fertilizer storages shall be constructed in the areas of restricted construction, that is in the coastal belt with the width of:

- 200 metres at Saaremaa, Hiiumaa, Vormsi and Narva-Jõesuu;
- 100 metres at seashores elsewhere and at the shores of Lake Peipsi;
- 50 metres at the shores of rivers with the catchment area of over 25 km and lakes with the area of over 10 hectars;
- 25 metres at the shores of rivers with the catchment area of 10 to 25 km and lakes with the area of 1 to 10 hectars.

Construction of manure and dung water storages on the area of restricted construction for the already existing farmsteads shall be harmonized with local nature conservation authorities.

In the area with unprotected groundwater the distance of a manure, liquid manure and dung water storage from a bored well shall be at least 50 metres and in the area with protected groundwater - at least 30 metres.

4. The rates manure utilization are given in table 2. The data concerns cattle dung on litter. In case of pig dung, these limit values must be multiplied by 0.75, in case of guano - with 0.2 and in case of horse manure - with 1.5.

**Table 2. Limit utilization rates of cattle manure on litter**

*per year.*

Region	Mean annual volume of manure rotation, t/ha.y			
	Grain	Grassland	Potatoe	Sugar-peat
In general in Estonia	30	20	30	30
Karst areas and areas with thin residual soil	20	15	20	20
Islands	20	10	20	20

A limit utilization rate is a mean volume of manure on litter per year taking into account pollution hazards of surface and groundwater. On establishing the actual utilization norms the sequence of crops in the rotation, the aftereffect of manure (20..30%) on the following year of fertilizing as well as the time of spreading the manure (in autumn or in spring) shall be taken into account.

The amount of organic fertilizer equal to a ton of dry cattle manure having direct effect on covering the nitrogen demand of plants is 1.5 kg N, in the first aftereffect year - 0.5 kg N and in the second aftereffect year - 0.25 kg N. As an aftereffect of grass plants rich in *Papilionaceae* the field crops can consume 50 kg N in the first aftereffect year and 25 kg N in the second aftereffect year.

The data given in the table are suitable for liquid manure and dung water as well, if these quick-acting fertilizers are used during vegetation period and taken into the soil at once.

5. The total permissible amount of phosphorus taken into the soil with manure and mineral fertilizers is given in table 3.

Table 3. The annual permissible amount of phosphorus taken into the soil as average within manure and mineral fertilizer rotations.

Region	Permissible annual amount kg P/(ha.y)
In general in Estonia	30
Pandivere upland and the moraine hills of South-Estonia	25
Karst areas and areas with thin residual soil; islands	20

The mean annual amount of phosphorus advisable for Estonia is meant for the average yield of grain - 3 t/ha. In case the yield is higher or lower, the amount may be changed correspondingly by 2.5 kg P/ha per every 500 kg/ha of over- or underyield.

In the areas very poor in phosphorus, the maximum amounts may be increased up to two times, in the areas poor in phosphorus up to 1.5 times. In the areas rich in phosphorus, the amounts shall be decreased twice and 5 times in the areas very rich in phosphorus.

In case of perennial crops an amount of up to three years may be given in reserve. It is forbidden to give phosphorus fertilizers in reserve on sandy soils, on soils tending to erosion and on flat valley soils. The amount of phosphorus given together with other fertilizers shall be decreased if sewage sludge is also used for fertilizing.

6. The limit amounts of mineral nitrogen are given in table 4.

The data given in the table are meant for the average grain yield - 3 t/ha. If the yield is higher or lower, the limit amounts may either be increased or decreased correspondingly by 10 kg N/ha per every 500 kg/ha of over- or underyield.

Table 4. Permissible annual amount of nitrogen given as an average within mineral fertilizer rotations.

Region	Permissible annual amount kg N/(ha.y)
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In general in Estonia	100
Karst areas and areas with thin residual soil	80
Moraine hills on South-Estonia	70
Islands	60

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7. The total amount of nitrogen shall not exceed the sum of the amounts given in tables 2 and 4. The amounts of nitrogen given with other fertilizers shall be decreased if the soil is fertilized with sewage sludge.

8. It is restricted to spread manure, liquid manure (slurry), dung water or mineral fertilizers on snow or on frozen soil as well as to spread mineral fertilizers from plains.