

Innovative greenhouse cultivation in compost barn

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Organic farming is basically connected to low input factors and to balance between plant and animal production. In Norway a greenhouse construction which in wintertime serves as stable for cows bedding on wood shavings connects these basic approaches in an innovative way. It makes building costs more reasonable and embodies a new era with peatfree cultivation. In compost barns set into practise mostly animal welfare has been investigated and has been proved to be good. Turning to investigation in the plant production and greenhouse function little has been done. Compost barns are known from different climate conditions as USA, Finland and Netherlands.

In the Norwegian case the main objective is to investigate if the compost of the bedding is suitable for cultivating vegetables immediately after the cattle leaves the stable to start the grazing period.

The case has been followed for two seasons. Temperature has been logged in two different depths in the bedding and samples are analysed for dry matter and nutrients. Germination of garden cress (*Lepidium sativum*), emission of greenhouse gasses, compost maturity, quality and guidelines has been examined.

The results so far showed that water holding capacity was low, pH was too high and consequently some nutrient uptake was lacking. The emissions of CH₄ and N₂O was low. The C/N ratio seemed reasonable and following maturity of the bedding which was best in 30 cm depths compared to 15 cm. Some inhibition of plant growth was detected. More garden cress germinated in samples from the deepest layer, but it was not good enough to recommend sowing directly in the compost bedding. Despite this, the farmers cultivated several types of vegetables.

To combine stable and greenhouse is interesting. With more experience and knowledge about management and compost process in beddings this is considered as a promising innovation.