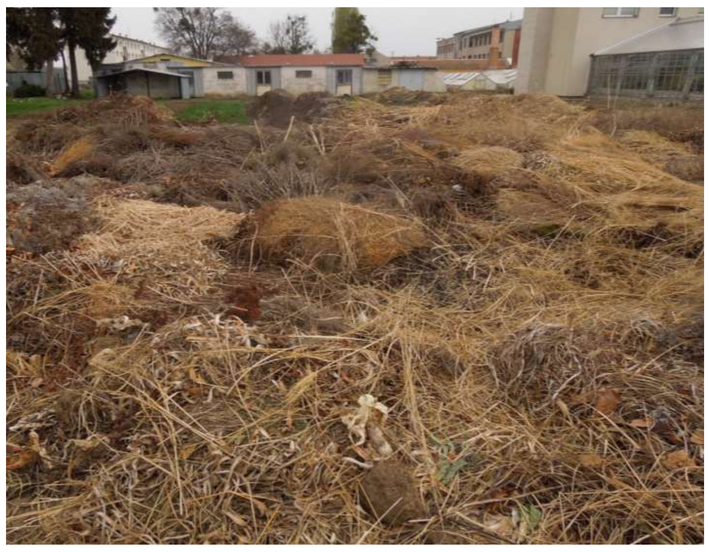
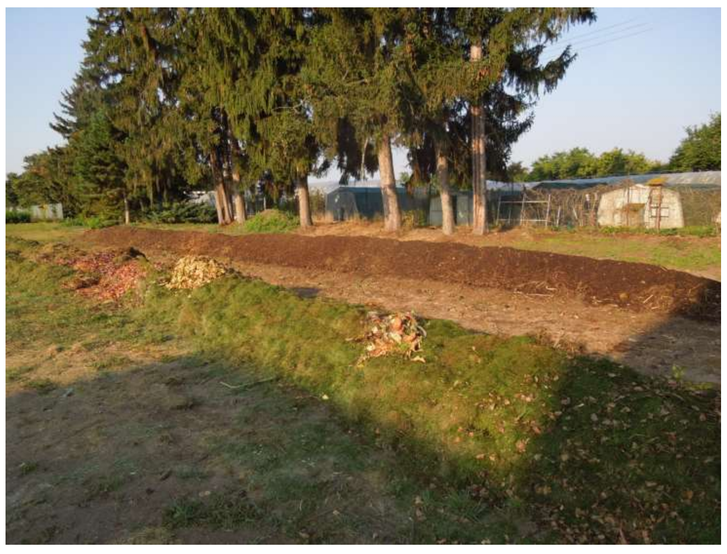
MENDELU
Faculty
of Horticulture

Department of Horticultural Machinery

Experimental composting facility

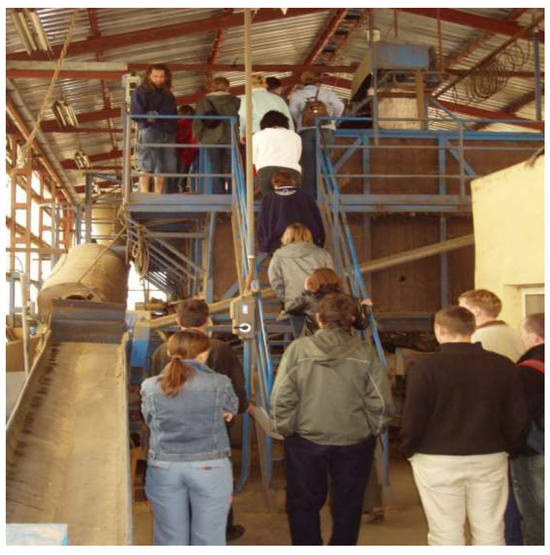
Composting biodegradable waste plays an irreplaceable role among waste processing technologies. This technology can be used to effectively utilise organic waste from agriculture, waste from maintenance of public green areas, communal waste, etc. In the field of horticulture, this mainly concerns wood chips, grass, fruit and vegetable waste, pomace, leaves, etc. The resulting product of processing these organic wastes is a stable and valuable organic fertilizer - compost. Application of compost to agriculturally used soil improves its physical and chemical properties. Regular and sufficient application of compost makes working the soil easier, increases its retention properties, contributes to renewal of microbial activity, restricts acidity, etc. The effect of retaining soil moisture in particular, results in more effective use of nutrients by plants, reduces water erosion, reduces water consumption and restricts dehydration of soil.





The Department of Horticultural Machinery at the Faculty of Horticultural in Lednice has been actively engaged in researching the issue of composting horticultural waste since 1995. Initial work between 1995 and 2002 involved composting grass from the chateau park and pomace and wood chips from the vineyards. The initial assessment period also included testing the PKS 2.8 tractor-mounted compost turner prototype. After the initial experiments, which concerned relatively small compost windrows volumes (up to 5 m^3), compost windrows were established in cooperation with agricultural subjects in the region, under pilot conditions, in 2002-2003. Between 2003 and 2015, a lot of attention was devoted to the issue of producing compost from the aspect of intensification of the process, verification of recipes, monitoring temperature development, moisture content, oxygen content, emission production, C:N ratio, bulk density, particle size and a number of other factors. These activities resulted in execution and successful defence of a number of bachelor's, diploma and dissertation theses, in successful solution of a number of research projects (IGA, NAZV), and in the addition of the subjects Equipment for Processing of Horticultural Waste and Waste Management in Processing Operations at the Faculty of Horticulture and Faculty of AgriSciences.

The need to improve the quality of the process of professional education, with maximum emphasis on supporting the acquisition of key professional competence by students and reinforcement of mutual collaboration between all branches of study at the Horticultural Faculty, led to establishment of the experimental composting facility at Faculty of Horticulture in 2016. This facility utilizes the composting technology of compost windrows, the total area of which is 980 m^2.



The composting facility's machinery includes a wheeled AVANT 635 OMT loader with front spade. The loader is used to transport the input materials, form windrows after turning, and when manipulating and storing the final compost. The ELIET Prof 5 garden waste crusher is another machine the facility has. This is a mobile crusher with propulsion provided by its own combustion engine. This device is used to crush the input materials to the required particle size (usually between 25 and 50 mm). The Euro Bagging HP 2.5 mounted compost turner plays an irreplaceable role from the aspect of intensification of the composting process by turning (aeration) and homogenization of raw materials formed into windrows. This is a compost turner with a horizontal rotor, of a working width of 2.5 m, supplemented by a hydraulic system for lifting the rotor into the vertical transport position.