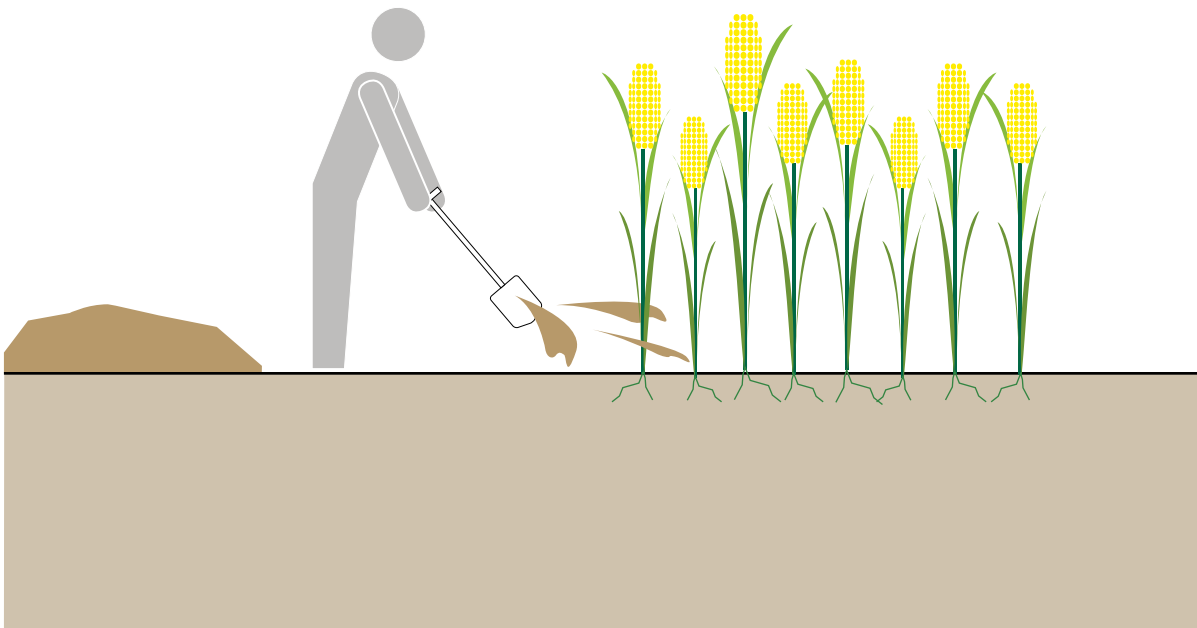


# Application of Pit Humus and Compost

Phase of Emergency	Application Level / Scale	Management Level	Objectives / Key Features
Acute Response * Stabilisation ** Recovery	** Household ** Neighbourhood * City	** Household ** Shared * Public	Productive use of nutrients, Use as soil conditioner
Space Required	Technical Complexity	Inputs	Outputs
*** High	* Low	● Pit Humus, ● Compost	● Biomass



Compost is a soil-like substance resulting from controlled aerobic degradation of organic material in e.g. Co-Composting facilities (T.11, T.12). Pit humus is the material removed from double pit systems (S.5, S.6). It is produced passively underground and has a different composition from compost. Both products can be used as soil conditioners.

The process of thermophilic composting generates heat (50 to 80 °C) which can kill most pathogens present in the material being composted. Double pit systems have almost no increase in temperature because the conditions in the pit (presence of oxygen, moisture, the carbon to nitrogen ratio) are not optimised for the composting processes. Because of this the material is not actually compost; it is referred to as pit humus. The texture and quality of pit humus depends on the materials that have been added to the excreta (e.g. organic matter) and storage conditions. The World Health Organization (WHO)

Guidelines for the Safe Use of Wastewater, Excreta and Greywater stipulate that compost should achieve and maintain a temperature of 50 °C for at least one week before it is considered safe to use. Achieving this value, however, requires a significantly long period of composting. For technologies that generate pit humus, a minimum of one year of storage is recommended to eliminate bacterial pathogens and reduce viruses and parasitic protozoa. WHO guidelines should be consulted for detailed information.

**Design Considerations:** It has been shown that the productivity of poor soil can be improved by applying equal parts compost and topsoil. A 10 × 10 m plot that is well fertilised with compost, managed and watered can produce sufficient vegetables for a family of 5 all year round, depending on the climate.

**Materials:** Materials required for Application of Pit Humus and Compost are locally available in most situations and include wheelbarrows, shovels, spades, rakes, and personal protective equipment (PPE). For cultivating land where compost or pit humus has been applied other gardening tools such as hoes, watering cans, seeds, etc. are required.

**Applicability:** Compost and pit humus add nutrients and organic content to the soil and improve the soil's ability to store air and water. They can be mixed into the soil before crops are planted, used to start seedlings or indoor plants, to plant trees, or simply mixed into an existing compost pile for further treatment. Utilising both pit humus and compost is appropriate for the stabilisation and recovery phases of an emergency. Food production as part of camp greening programmes have been shown to increase the availability of micronutrients and contribute to overall food security, resilience and well-being of the affected community. Where food production is not an option, pit humus and compost can be used to restore land where natural disasters have removed the top layer of the soil.

**Operation and Maintenance:** Pit humus must be allowed to adequately mature before being removed from the system. It can then be used without further treatment. Matured pit humus will be dewatered and consolidated making it quite difficult to remove mechanically (see Manual Emptying and Transport **(C.1)**). Workers should wear PPE. Conducting training on the best methods of gardening and food production may be required.

**Health and Safety:** Pit humus, particularly from double pit systems that are not used correctly, poses a risk of pathogen transmission. If in doubt, material removed from the pit should be further composted in a regular compost heap before being used. Compost and pit humus are usually applied prior to the planting season. As opposed to sludge, which can originate from a variety of domestic,

chemical and industrial sources, compost and pit humus have very few non-organic inputs. The only non-organic contaminants would originate from human excreta (e.g. pharmaceutical residues) or from contaminated organic material (e.g. pesticides). Compost and pit humus are considered less contaminated than sludge. They are inoffensive, earth-like products. However, direct, unprotected handling should be actively discouraged.

**Costs:** The capital costs for tools to apply pit humus and compost are generally low. Additional infrastructure such as greenhouses or poly-tunnels or irrigation systems may also be required which would increase costs. The operating costs are low if self-managed.

**Social Considerations:** Social acceptance may be a challenge for communities that are not familiar with using pit humus or compost. Conducting training and demonstration activities that promote hands-on experience can effectively show their non-offensive nature and their beneficial use. If vegetable production is being promoted, the varieties should reflect those grown and consumed in the local context.

#### **Strengths and Weaknesses:**

- ⊕ Low risk of pathogen transmission
- ⊕ Can improve structure and water-holding capacity of soil and reduces chemical fertiliser needs
- ⊕ May encourage income generation (improved yield and productivity)
- ⊕ Can strengthen relations with land owners and authorities by greening and improving surrounding environment
- ⊖ Commonly requires an extended period of support to take the process through a complete cycle
- ⊖ Social acceptance may be low in some areas

→ **References and further reading material for this technology can be found on page 195**