- Very few studies to investigate risk of microplastics to soil biota and incorporation into terrestrial food chain.
- Studies focus on earthworm species but Colembola, isopods and chickens have also been tested
- HDPE, LDPE, PVC, PS, PU have all been tested, as well as a plastic residue mix. PE is most commonly used for testing.
- Some studies test for adverse effects, whilst others investigate the role of soil-dwelling organisms in the transport/distribution of microplastics.

NIVA

- Adverse effects
  - e.g. reduction in growth and reproduction in collembolans[1], histopathological damage in earthworms[2]
  - transfer of contaminants e.g. PBDE[3]
  - No adverse effects at low concentrations or for isopods

- Evidence of microplastic transport through predator-prey relationships – microplastics pass up through the food chain[4]

- Fragmentation of microplastics in earthworm gut[5]

- Evidence of trophic transfer that may potentially introduce microplastics to the human food chain
  - MPs in poultry (10.2 MPs per gizzard)[6]

[1] Zhu et al. 2018. Soil Biol. Biochem. vol. 116; [2] Rodriguez-Seijo et al. 2017. Env. Pollut. vol. 220; [3] Gaylor et al. 2013. Env. Sci. Technol. 47;
[4] Zhu et al. 2018. Env. Pollut. vol. 235; [5] Huerta Lwanga et al. 2016. Env. Sci. Technol. vol. 50; [6] Huerta Lwanga et al. 2017. Sci Rep. vol. 7

Fate of microplastics in soils

- **Transfer**: Runoff/erosion from wind and water – particles potentially transferred to other environments e.g. aquatic systems (and may eventually reach the ocean)

- **Accumulation**: aggregation, agricultural practices (tilling etc.), bioturbation, and burial due to successive flooding may lead to the accumulation of microplastics into the soil profile

- Microplastics in the soil profile may be leached to groundwater aquifers, but this has not yet been investigated.
    - Incorporation of microplastics into burrows (e.g. by earthworms) may increase the risk through preferential flow.
    - Although this may be highly dependent on properties such as particle size and surface charge