

Compacted Garden Soil Checks

Distinguish surface crust, compaction, clay texture, and waterlogging before treating or digging.

Garden Bed / Area Inspected: _____

Date: _____

1. WHY HYDROGEN PEROXIDE BUBBLES DO NOT LOOSEN COMPACTED CLAY

Reaction: $2 \text{H}_2\text{O}_2$ (hydrogen peroxide) $\rightarrow$ $2 \text{H}_2\text{O}$ (water) + O_2 (oxygen gas). Peroxide has one more oxygen ATOM than water (not an extra oxygen molecule). Soil catalase enzymes trigger rapid surface fizzing. Temporary gas bubbles escape at the surface; they do NOT move dense clay plates apart into stable aggregates, create lasting soil pore spaces, fix poor subsurface drainage, or cure root rot.

2. PRACTICAL SOIL-IMPROVEMENT DECISION CHECKLIST

- ☐ Identify the condition: thin dry surface crust, deeper compacted layer, natural clay texture, or waterlogging.
- ☐ Run the squeeze test at 3-4 in. deep: if soil is wet, slick, or ribbons without crumbling, DO NOT walk or dig.
- ☐ If the bed is EMPTY and moderately moist, use a digging fork to gently rock and crack dense layers without flipping.
- ☐ If established plants are growing, skip deep digging; top-dress 1-2 in. of finished compost and mulch the surface.
- ☐ Keep feet on paths or stepping boards; use raised beds with topsoil + compost where site drainage stays poor.

3. BED-BY-BED SOIL STRUCTURE & DRAINAGE LOG

Date	Bed / Zone	Squeeze Test (3-4 in.)	Condition Found	Compost / Mulch / Path Action
Bed 1:				
Bed 2:				
Bed 3:				
Bed 4:				
Bed 5:				

4. KEY CAUTIONS & UNIVERSITY EXTENSION REFERENCES

Avoid adding sand to clay (creates a dense, brick-like mix) or applying gypsum without a soil test.

Ask Extension FAQ #848356: <https://ask.extension.org/kb/faq.php?id=848356>

UMN Extension Soil Compaction: <https://extension.umn.edu/natural-resources/conservation/agricultural-soil-and-water/soil-compaction>

UMD Extension Soil Health & Raised Beds: <https://extension.umd.edu/resource/soil-health-drainage-and-improving-soil>