

GROWER | Section 1: Getting Oriented | 3a: Your Soil Story: Sensory Soil Assessment

Activity 1 — Choose your sample locations

Select 2–4 locations that represent the range of soil conditions on your growing site. At a minimum, you want to assess your most productive ground and the area where crops most often show water stress. Mark each location on a simple farm sketch before sampling.

Consider including:

- A representative area from each distinct soil zone on your farm
- One area that dries out earliest in the season
- One area that holds moisture longest
- Any area where crop performance has been consistently different from neighboring areas without an obvious explanation

Equipment options:

Five-foot soil core assessments can be more informative than one-foot assessments where water is limited or irrigation is unavailable. It is important to understand plant-available water-holding capacity, drainage, compaction, pH, and nutrient availability to the depth your crops will be rooting. Your local Soil and Water Conservation District (SWCD), Extension, or NRCS offices may be able to loan equipment or provide a technical assistance site visit. See the resources box at the end of this page for more information.

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Activity 2 — Sensory soil assessment

This approach uses your senses to assess the soil. Use a shovel, soil auger, or probe to collect a sample. Feel moist soil between your fingers, see if it forms a ball or ribbon, watch how quickly water soaks in after a rain or irrigation, and look for aggregation, compaction, and rooting depth in a hole or soil core. This is an excellent opportunity to use the hand-texturing method — Estimating Soil Moisture by Feel and Appearance (NRCS) described in Section 2 of the publication alongside the observations below.

While digging, imagine you are plant roots working downward through the profile. Observe what's happening at each depth:

- **Texture:** squeeze moist soil and try to form a ribbon. Gritty and won't ribbon = sandy. A short crumbly ribbon = loam. A long smooth ribbon = clay-rich. Note any abrupt changes in texture as you go deeper.
- **Structure and aggregation:** well-aggregated soil breaks into irregular, rounded, crumb-like peds with visible pore spaces. Massive aggregates with platy or angular structure with no visible pores indicates poor structure or compaction. Dense layers that resist the auger are likely restrictive.
- **Moisture and mottling:** note where the profile transitions from moist to dry. Mottling — irregular rusty or gray patches in the subsoil — indicates periodic saturation and can signal a drainage limitation or fluctuating water table.
- **Root penetration:** follow roots down the profile. Where do they encounter resistance? Abrupt changes in rooting often correspond to restrictive layers even when the texture change is subtle.
- **Biological activity:** earthworm channels, visible fine roots throughout, white fungal threads (mycorrhizae), and crumbly well-aggregated structure all indicate healthy biology and good water and nutrient cycling.
- **Smell:** healthy, biologically active soil has a rich earthy smell. Sour, sulfurous, or swampy odors suggest waterlogging, compaction, or depleted microbial communities.

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Location 1:

Depth	Horizon (A, B, C...)	Texture (ribbon test)	Structure /aggregation	Color and moisture	Roots present?	Notes /constraints
0-12 in						
12-24 in						
24-48 in						
Below 48 in (if reachable)						

Location 2:

Depth	Horizon(A, B, C...)	Texture (ribbon test)	Structure /aggregation	Color and moisture	Roots present?	Notes /constraints
0-12 in						
12-24 in						
24-48 in						
Below 48 in (if reachable)						

From sensory observation to strategy: After completing your profile observation, find the row or rows that most closely match what you found. You may recognize your farm in more than one. This table connects your observations to a starting place, not a final answer.

When I dug into my soil, I observed...	✓	Strategy areas worth exploring first
Roots stop or deflect noticeably at 12–24 inches, and the layer below is dense or resists the auger	<input type="checkbox"/>	Start by addressing what’s stopping the roots before investing in surface practices: deep-rooted cover crops (tillage radish, chicory, tap-rooted legumes), subsoil aeration, NRCS technical assistance for earthworks. Until roots can go deeper, water storage is capped at that depth.
Soil at depth breaks into large blocks with few visible pores; earthworm channels are scarce or absent	<input type="checkbox"/>	Biological practices: diverse cover crop mixes, compost rather than synthetic fertilizers, minimal soil disturbance, permanent living pathways. Soil structure responds to management faster than texture does, and biology is the driver.
Rusty orange or grayish patches (mottling) appear in the subsoil	<input type="checkbox"/>	Drainage management alongside moisture retention: earthworks, bioswales, contour strip cropping; organic matter building to improve infiltration and drainage in the wet season and moisture retention in the dry season.
The profile stays visibly moist well into summer; roots extend 30 inches or more	<input type="checkbox"/>	This site has water resilience potential: consider dry farming trials with appropriate varieties and planting timing. Focus assessment on variety selection and pre-season soil moisture banking.
The profile transitions from moist to dry within the top 8–12 inches by early summer	<input type="checkbox"/>	Mulch and cover crops to slow surface evaporation; organic matter building to increase surface layer retention; drip irrigation to deliver water efficiently where roots are active.
Conditions vary significantly across the farm – different textures, rooting depths, or moisture behavior in different areas	<input type="checkbox"/>	Map the variation before investing uniformly. Different zones may call for different strategies: dry farming on deeper or moister areas, intensive soil building on more limited areas. The assessment effort here saves wasted investment later.

PUTTING IT INTO PRACTICE

- What was the most significant change you observed as you went deeper? Consider texture, moisture, and/or root presence.
- Did you find any evidence of a restrictive layer? At what depth?
- What did your observations tell you about the biological health of your soil?

Carry forward: *Your effective rooting depth at each location and any restrictive layers you found carry into Article 3B for the AWHC calculation.*