

Soil Analysis Report for undisclosed location in St. Albert, Alberta — Readings Taken on 2025-10-04

1. Soil Analysis

Parameter	Reading Range (Across 4 Samples)	Optimal Range*	Interpretation
Temperature	10.8 – 13.9 °C	15–30 °C	Cool soil, slightly below optimal for warm-season crops; suitable for cool-season crops like grains and brassicas.
Moisture	8.3 – 20.2 %	50–80 % (field capacity)	Dry to moderately moist soil; risk of drought stress and limited nutrient uptake.
Conductivity (EC)	4 – 117 µS/cm	<2000 µS/cm	Extremely low EC indicates very low soluble salts and nutrient content — not saline, but nutrient-poor.
pH	6.7 – 7.0	6.0–7.5	Neutral, excellent range for most crops.
Nitrogen (N)	0 – 5 mg/kg	20–50 mg/kg	Very low — nitrogen deficiency likely.
Phosphorus (P)	0 – 8 mg/kg	15–30 mg/kg	Very low — root growth and flowering will be limited.
Potassium (K)	0 – 18 mg/kg	100–200 mg/kg	Very low — plants will have weak stems and poor drought resistance.
Fertility Index	2 – 64 mg/kg	>200 mg/kg (indicative of good fertility)	Overall soil fertility is very low .



2. Summary of Current Soil Health

The soil in St. Albert currently exhibits **low fertility, low nutrients, and limited moisture**.

Despite having an ideal pH for most crops, the soil is nutrient-poor and requires substantial enrichment before planting nutrient-demanding crops.

No salinity issues are present — the low EC is a positive sign — but the low NPK readings suggest the soil has seen either prolonged nutrient depletion or minimal fertilization.

3. Recommended Actions

3.1 Organic Methods

1. **Add compost or well-rotted manure** — apply 4–6 kg/m² and mix into the top 15 cm of soil.
Boosts NPK levels and improves water-holding capacity.
2. **Grow a legume green manure (e.g., clover, vetch, field peas)** over fall or early spring to fix nitrogen biologically.
3. **Mulch** bare soil with straw or leaf compost to conserve limited moisture and moderate soil temperature.
4. **Use organic nutrient boosters:**
 - **Bone meal** (phosphorus source) – 50–100 g/m².
 - **Wood ash or seaweed meal** (potassium source) – 100 g/m² max to avoid pH rise.
5. **Incorporate biochar** (1–2 kg/m²) with compost to improve nutrient retention long-term.

3.2 Inorganic Methods

1. **Apply balanced fertilizer (e.g., 10-10-10 or 12-12-12 NPK)** at 100–150 kg/ha, split into two doses (pre-planting and mid-season).
 2. **Nitrogen boost:** Urea (46-0-0) at 60 kg N/ha if planting cereals or leafy vegetables.
 3. **Phosphorus supplement:** Single superphosphate (0-20-0) at 50 kg P₂O₅/ha.
 4. **Potassium supplement:** Muriate of potash (0-0-60) at 40 kg K₂O/ha.
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5. **Irrigation:** Light but frequent watering to raise soil moisture to ~40–60%. Avoid waterlogging.

3.3 Integrated Methods

1. **Initial correction:** Use inorganic fertilizer for immediate nutrient supply, followed by compost or manure for sustained release.
2. **Rotation strategy:** Alternate heavy-feeding crops with legumes to maintain nitrogen levels.
3. **Mulch + Drip Irrigation:** Combine water conservation (mulch) with efficient watering (drip or soaker hoses).
4. **Monitor soil quarterly** with the sensor — track recovery in NPK and moisture.

4. Recommended Crops for This Soil

Given the **neutral pH**, **cool temperature**, and **low fertility**, start with **cool-season and low-input crops** while building fertility:

Crop Type	Examples	Reason
Nitrogen-fixing cover crops	Clover, vetch, peas	Enrich soil N and organic matter.
Cereals tolerant of poor soil	Rye, oats, barley	Grow well in low-fertility, cool soils.
Root vegetables (moderate demand)	Carrots, radishes, beets	Tolerate low fertility; improve as soil enriches.
Future (after fertility improvement)	Potatoes, cabbage, lettuce, tomatoes	Require higher NPK; possible after 1–2 seasons of amendment.

5. Next Steps (Action Checklist)

✓ Immediate (Fall 2025):

- Add 4–6 kg/m² compost + 1 kg/m² biochar.



- Sow clover or vetch cover crop before frost.
- Mulch the surface to retain moisture.

✓ **Spring 2026:**

- Retest soil with 8-in-1 sensor.
- Apply 10-10-10 fertilizer if N < 20 mg/kg persists.
- Plant early cereals or root vegetables.

✓ **Summer 2026:**

- Maintain consistent soil moisture (~50%).
- Observe crop response and record new readings.

✓ **Long-term (2026–2027):**

- Rotate with legumes annually.
- Continue composting and organic matter addition.
- Monitor fertility and EC trends — aim for fertility index >200 mg/kg by mid-2027.

Adjusted 'ask' for this report;

These readings were taken at the end of the growing season. Please regenerate the report, adding advice on what amendments to make as we prepare these raised beds for winter. include where in the area of Sturgeon County we could procure the needed amendments.

Here's a revised winter-prep report for your raised beds, tailored to your site in St. Albert / Sturgeon County, along with local sources for amendments.

1. Winter Preparation Strategy & Timing

Because the readings were taken at the end of the season, your goal now is to *protect the soil, set it up for nutrient build-up over winter, and minimize nutrient losses*. Key considerations:

- Prevent soil erosion and leaching.



- Build organic matter and nutrient reserves.
- Maintain some biological activity (if possible) under cover.
- Plan for spring readiness (looser soil, more nutrients).

Timing: as soon as you've removed the summer crops and cleared debris (October–early November), apply amendments and then cover the soil (mulch or cover crop). Ensure amendments are incorporated (lightly) before freeze.

2. Specific Winter Amendments & Practices for Your Soil Conditions

Given your low N, P, and K and generally poor fertility, here is what to apply this fall/early winter, and how:

2.1 Organic & Integrated Amendments (preferred under winter conditions)

These amendments will build long-term soil health and reduce the risk of leaching.

Amendment	Purpose / Effect	Rate for Raised Beds	Method / Timing	Notes / Precautions
Compost / well-matured manure	Adds N, P, K, improves soil structure & water retention	~3–5 kg per m ² (or ~3–5 L per 0.3 m ² bed section)	Spread over the surface, then lightly fork in the top 5–10 cm	Use high-quality, weed-seed-free compost
Cover crop / green manure	Fix N (if legumes), protect soil, feed microbes	Clover, vetch, peas, or a mix	Sow in late fall (if enough growing days remain) or early spring, allow to grow until just before frost or before spring planting	If frost kills it, leave residue on the surface
Mulch / straw / leaves / wood chip	Insulate soil, reduce erosion, maintain moisture	5–10 cm layer	Apply after amendments; leave through winter	Use carbon-rich mulch to gradually decompose



Amendment	Purpose / Effect	Rate for Raised Beds	Method / Timing	Notes / Precautions
Bone meal / rock phosphate	Phosphorus supplement (slow-release)	20–50 g per m ²	Mix into top 5–10 cm now	Best in neutral pH soils; don't overapply
K sources (organic) , e.g. wood ash, greensand, kelp meal	Potassium and trace minerals	50–100 g per m ² (if wood ash, use more moderate)	Broadcast and lightly incorporate	Wood ash is alkaline—don't overuse if wanting to keep pH balanced
Biochar + compost inoculum	Helps retain nutrients, improve microbe habitat	1–2 kg per m ² mixed with compost	Blend with compost and mix into topsoil	Especially useful in raised beds with limited volume
Gypsum (if needed for structure)	Aids soil aggregation (less important in raised beds)	Use lightly if heavy compaction or clay source	Topdress or incorporate	Not strictly needed unless you see compaction
Protective barrier / fabric	Prevent nutrient loss via wind/erosion	–	Lay row cover or light geotextile	Helps keep the amendments in place

Integrated approach: Combine compost + bone meal + wood ash (if needed) in fall, sow cover crop over it, then mulch to protect. Come spring, incorporate the residue and re-test.

2.2 Inorganic Supplements (use cautiously in fall)

If you want a more aggressive nutrient boost, you can add inorganic fertilizers this fall, but with caution (risk of leaching over winter is higher if precipitation is heavy).

- A balanced, slow-release fertilizer (e.g. 10-10-10 or 14-14-14) applied at half rate (e.g. 50–70 kg/ha equivalent), lightly incorporated.
- Or apply phosphorous- and potassium-rich fertilizers (e.g., triple superphosphate, muriate of potash) now, leaving most nitrogen for spring.



- Use urea or other high-N fertilizers only if cover is very protective and soil moisture is controlled—otherwise hold N until spring.

Because your N reading is critically low, you must replenish, but doing so in fall risks loss. Better to lean on organic N sources (compost, cover crops) and light inorganic N in spring.

3. Suggested Winter Prep Workflow (Raised Beds)

1. Remove all crop debris, weeds, and roots.
2. Lightly loosen topsoil (top 5 cm) with a fork or broad fork.
3. Spread compost + biochar + bone meal + other amendments.
4. Mix lightly into the top 5–10 cm (don't completely invert).
5. Sow a winter-hardy cover crop (clover, winter pea, or cover mix).
6. Mulch surface (5–10 cm) with straw, shredded leaves, or wood chips.
7. If available, cover with light row cover or geotextile to protect from erosion.

In spring, when the soil thaws but before planting, cut down cover crop (if grown), incorporate residue, and retest before final fertilizer application.

4. Local Sources in Sturgeon / St. Albert Area for Amendments & Supplies

Here are several local suppliers you can contact or visit for compost, soil mixes, fertilizers, mulch, and amendments:

Supplier	What They Offer / Notes	Location / Contact
Roseridge Compost Program	Free compost pickup (Category A compost), bulk orders available (rosenridge.ab.ca)	Roseridge Waste Management Center, 2 km east of Morinville (rosenridge.ab.ca)
Sturgeon Valley Fertilizers Ltd. (SVF)	Bagged fertilizers, custom blends, agronomy support (SVF)	55003 Range Rd 253, Sturgeon County (St. Albert area) (SVF)



Supplier	What They Offer / Notes	Location / Contact
Riverbend Landscape Supply	Bulk and bagged compost, soil, landscaping supplies (riverbendlandscape.ca)	In Sturgeon County / local area — call 780-915-3540 (Facebook)
Debs Greenhouse & Garden Centre	Garden soils, amendments, mulch, potting mixes (Debs Greenhouse Garden Centre)	25505 AB-642, Morinville, AB (Debs Greenhouse Garden Centre)
High Q Greenhouses Ltd.	Greenhouse, plant supply; may also carry amendments or connect you locally (MapQuest)	55431 Range Rd 262, Sturgeon County (MapQuest)
Park Topsoil (Edmonton / area)	Screened topsoil, garden mix, compost, delivery (Park Topsoil)	Serves Sturgeon County / Edmonton area (Park Topsoil)
The Black Dirt Company	Bulk compost, topsoil, landscaping supplies, and delivery to your site (The Black Dirt Company)	Spruce Grove / Edmonton area, service to surrounding municipalities (The Black Dirt Company)

Tips when contacting suppliers:

- Ask about the *curing time* of compost (well-cured is better for soil health and less risk of tying up N).
- Request results of compost testing (some composts have residual herbicides or salts).
- Order early, especially for bulk deliveries, before the ground freezes and supply becomes limited.
- Ask about delivery costs to your address — many suppliers will deliver to rural areas.



5. Revised Winter Prep Action List (for Sturgeon Region)

- ☒ Order and arrange delivery or pick-up of compost, manure, bone meal, wood ash, biochar (if used).
 - ☒ Clean and clear raised beds of crop residue.
 - ☒ Loosen topsoil (5–10 cm) and apply amendments.
 - ☒ Sow cover crop or green manure (if timing allows).
 - ☒ Apply mulch (5–10 cm) to protect soil over winter.
 - ☒ Use row cover or light protective cover if wind or erosion is a concern.
 - ☒ In late winter / early spring, cut and incorporate cover crop residue, retest soil, and apply any additional fertilizers before planting.
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If you like, I can map out **exact amendment quantities for each raised bed** (based on its area and depth), and plot a **winter cover crop calendar** specifically for the Sturgeon / St. Albert zone. Do you want me to do that?

