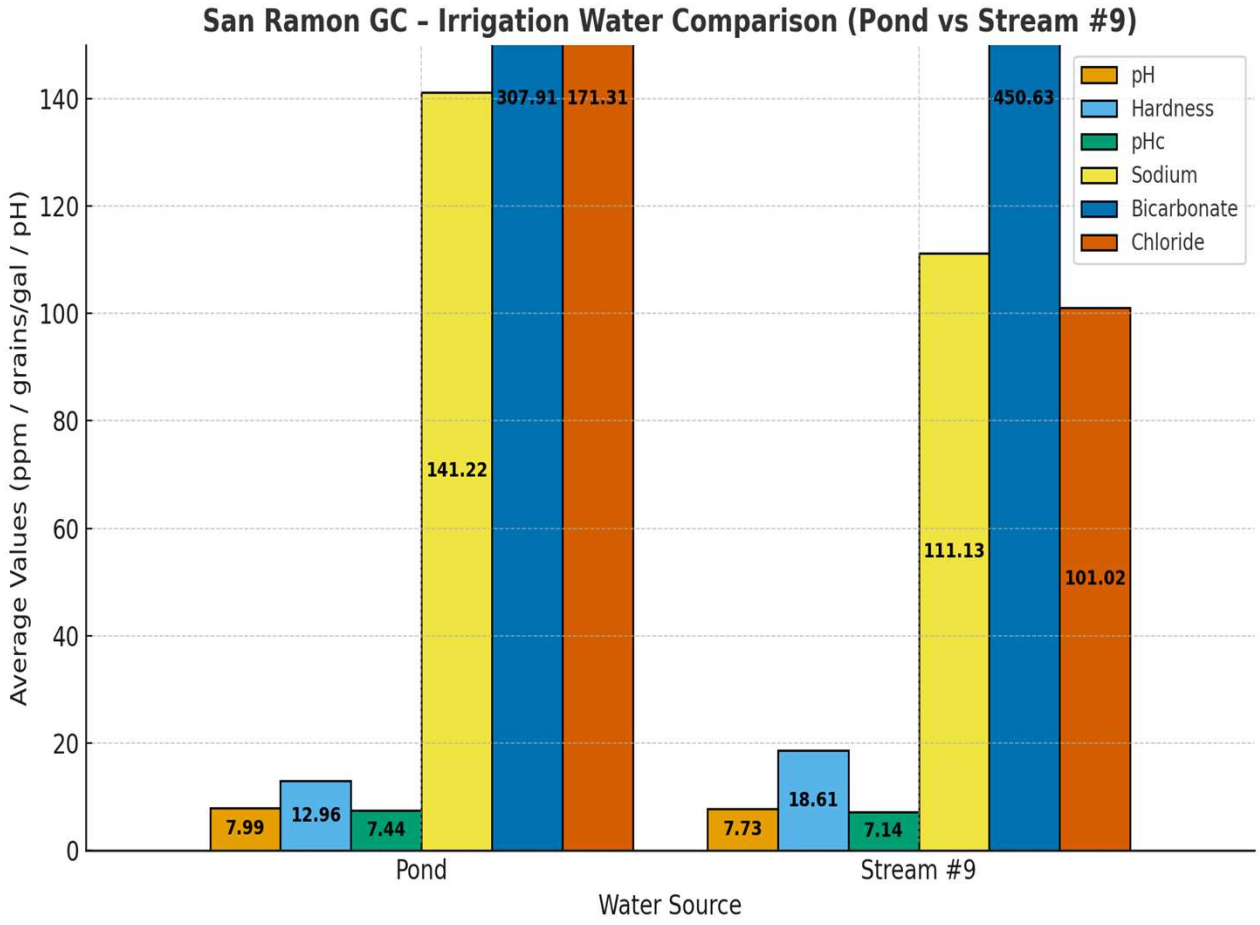
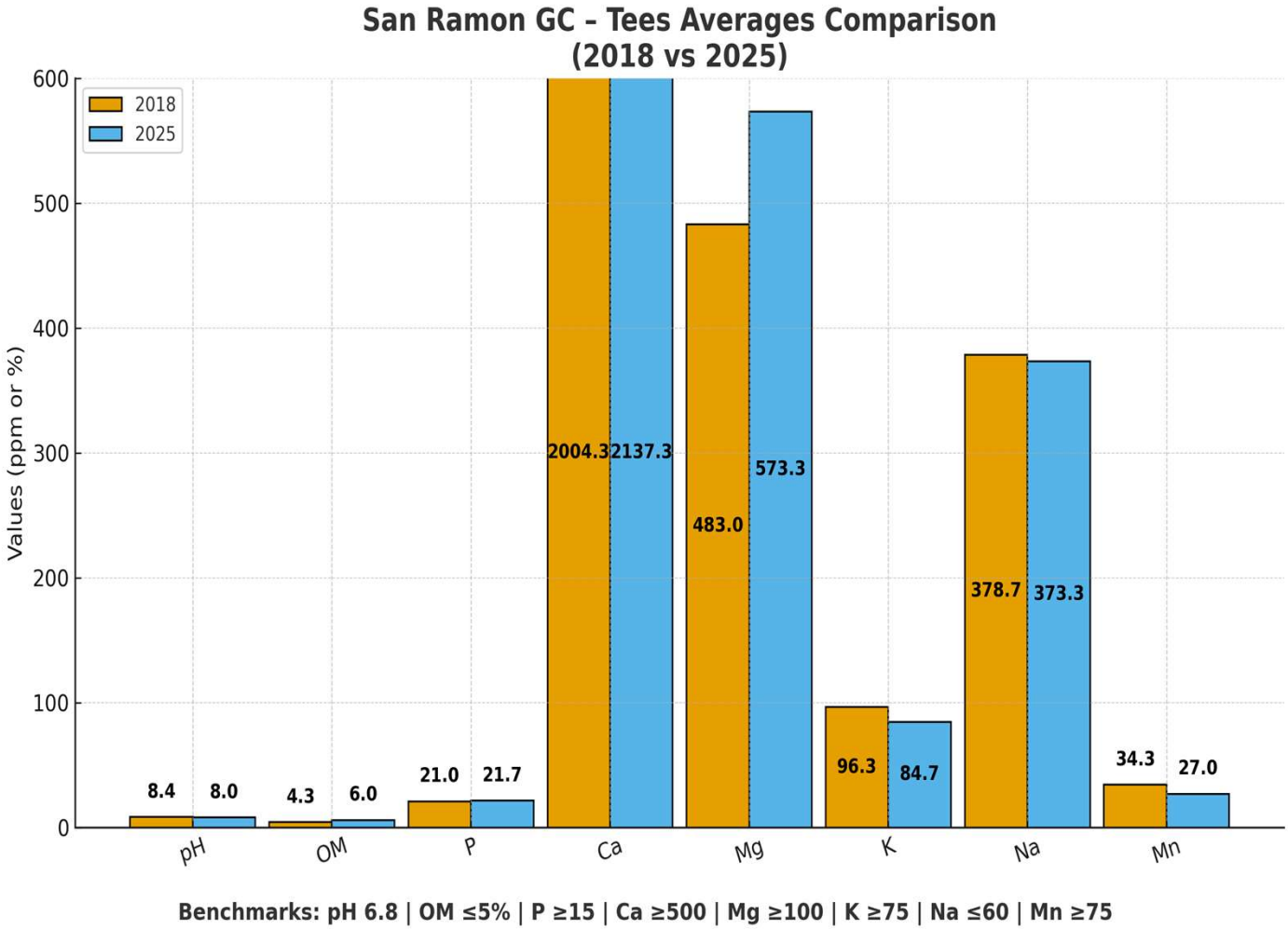
IRRIGATION WATER



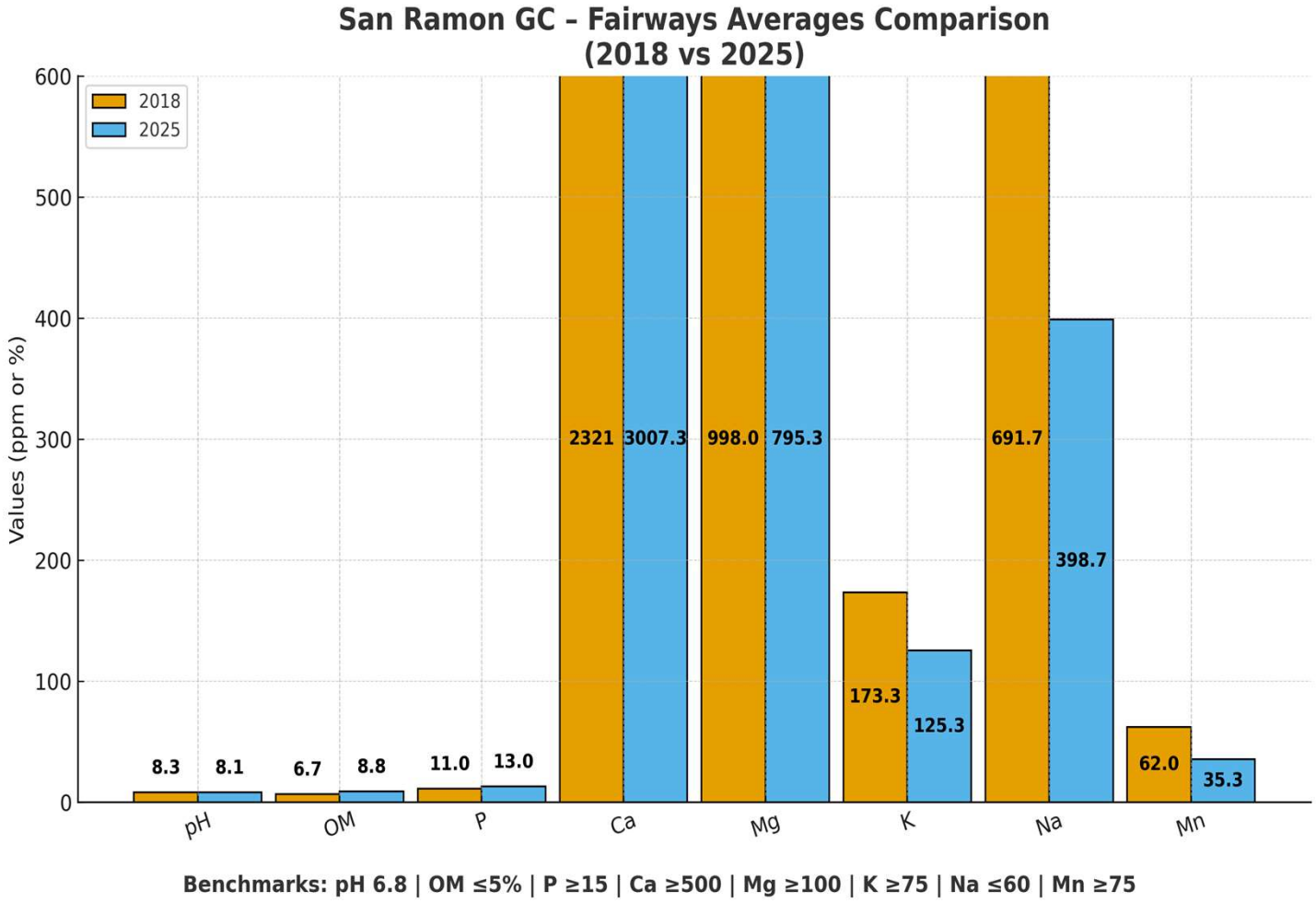
- These averages include the results going back to 2018 on each water source. There is not a significant enough difference between the two to affect the turf more- in a negative way- just using one or the other source.

TEES



- The natural soils (Tees and Fairways), are very high in minerals and especially magnesium. That coupled with high pH soils and the irrigation water source make it so that a lot of these nutrients are not available without some acidification. Adding things to the spray tank such as ***pHacid, Blast or Hydration A plus***, will access these nutrients- at least temporarily.

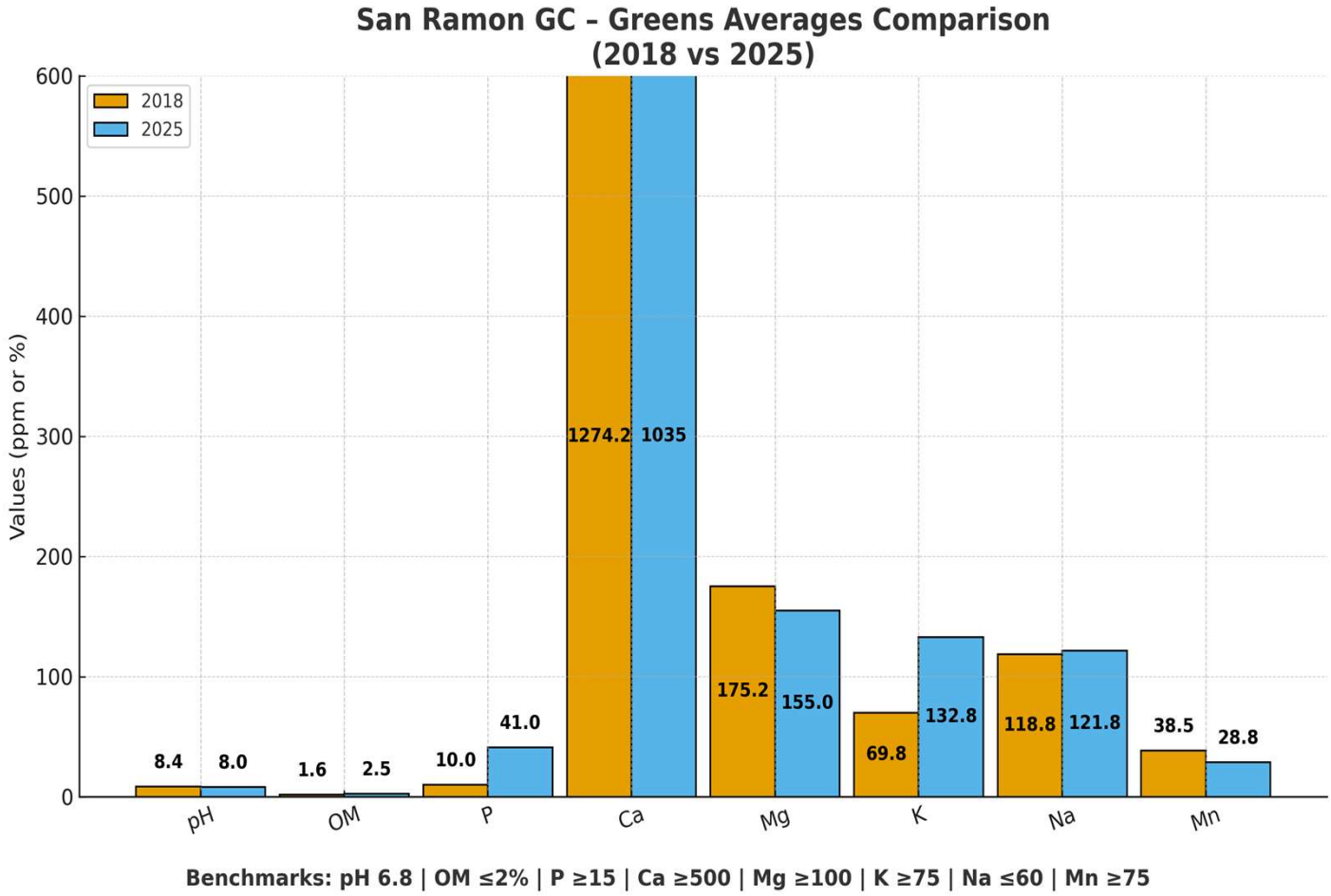
FAIRWAYS



Benchmarks: pH 6.8 | OM ≤5% | P ≥15 | Ca ≥500 | Mg ≥100 | K ≥75 | Na ≤60 | Mn ≥75

- The fairways are like the Tees in minerals but at an even higher level. That off colored grass you see that is yellow in random spots around the golf course, is a direct effect from these high levels of magnesium. Magnesium is a higher pH and very sticky in most cases. That stickiness can lead to soils that are very hard to penetrate. Since we sampled these holes in 2018 the organic material has also increased about 2%. Although I don't find your fairways to be thatchy, any core aerification would be beneficial.

GREENS



- The greens show a good increase in phosphorus and potassium compared to 2018. One area that's important that is decreasing is manganese. Certainly, any foliar manganese is helpful for the plant tissue but using something like a manganese oxide or manganese sulfate on the greens in a routine fashion will help increase that level.

SUMMARY

San Ramon Golf Club – Overall Soil Health Summary (2018–2025)

Tees

- pH ~8.0–8.2 — stable and slightly alkaline; no acidification required.
- Organic Matter ~4–5% — within the ≤ 5% benchmark; maintains infiltration and surface firmness.
- Calcium > 2000 ppm — excellent base saturation, balanced by moderate Mg and K.
- Sodium < 500 ppm — manageable; continue periodic deep flushing during peak irrigation.

Fairways

- pH ~8.1 — consistent, moderate bicarbonate load from irrigation water; monitor for carbonate buildup.
- OM ~8% — slightly elevated; topdressing and light coring each spring recommended.
- Calcium 2,300 → 3,000 ppm — strong upward trend indicating improved exchange capacity.
- Na ≤ 550 ppm — manageable under regular leaching.
- Mn steady ~40 ppm — adequate for disease suppression and color stability.

Greens

- pH ~8.0 — slightly high but stable; monitor bicarbonate load from irrigation pond sources.
- OM 2.5–3.0% — near target (≤ 2% goal); one extra mid-summer venting pass recommended.
- Ca ~1,000–1,300 ppm — ideal range for structural stability in sand profile.
- Na ≤ 150 ppm — excellent; water management and infiltration practices effective.
- Mn 20–55 ppm — adequate for bent/Poa color and summer stress protection.

Summary

Soil chemistry at San Ramon GC shows steady alkalinity but strong structural integrity across all surfaces.

2025 improvements in Ca and Mn reflect improved base saturation and balanced micronutrient support.

Focus for 2026: light OM reduction in fairways and continued Na management via deep flushing.

Yellowing Turf in High-Magnesium Soils — Causes & Corrections

When It Happens

- Yellowing (chlorosis) appears even when soil tests show adequate nutrients — because excess magnesium interferes with nutrient uptake and soil structure.

Mechanisms Behind the Yellowing

- Excess magnesium competes with calcium and potassium, reducing K uptake needed for chlorophyll formation.
- High pH and bicarbonates cause iron and manganese to oxidize, locking them out of root access.
- Tight, compacted Mg-rich clays restrict oxygen and infiltration, leading to short, inefficient roots.
- Magnesium carbonates buffer soil pH high, reinforcing alkalinity problems after each irrigation.

Field Clues

- Turf stays yellow-green even with good nitrogen levels.
- Color improves briefly after foliar Fe or Mn sprays.
- Soil feels slick when wet, crusty when dry — classic Mg compaction.
- Fairways and roughs irrigated with high-bicarbonate or reclaimed water show symptoms first.

Corrections & Management

- Apply gypsum or calcium thiosulfate to displace magnesium and improve soil structure.
- Use acidified irrigation or N-Furic blends to reduce bicarbonates and lower pHc below 8.4.
- Apply chelated iron foliar for quick color recovery.
- Maintain Ca:Mg ratio above 3:1 and keep Mg base saturation under 15%.

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