



Soil Testing Summary Write-up for Kline Ranch

- **Rancher Name (can be kept confidential if desired):** Jeremy Kline
- **Location:** North of Hayden
- **Date of Soil Tests:** May 7th, 2020
- **Agricultural Use(s)** (e.g. dryland hay, alfalfa, grazing, etc.): Alfalfa/hay
- **Challenges and Conservation Objectives (as presented by producer):** Sections of alfalfa the field have been under producing. It appears that certain sections have a limiting factor affecting alfalfa vigor.
- **Summary of Comprehensive Soil Test Results:** Test results showed generally fertile soils; the soil fertility score integrates nutrient status with the soil health score. This correlates closely with sustainability of crop production. The soil health score was slightly low for the region indicating lower, key biological traits. A high overall fertility score and a low soil health score indicate a heavy fertilized soil that is not being optimized for biology. CO₂ respiration is 45.9 ppm and SLAN amino-N is 79 ppm, this indicates the probability that soils will respond to increasing Nitrogen is moderate. The Phosphorus storage and Swiss CO₂-Equilibrium P are above normal and optimal. The soluble (or available) Nitrogen is 4 ppm which is very low. However, the estimate biological and total potential Nitrogen are and 53 ppm which are moderately high. The soil bulk density is 1.08 which is optimal. Bulk density is affected by geologic parent material, sand, silt and clay. It is influenced by humus and microbe rate. The VAST aggregate stability score is 8 which is low. Aggregate stability depends on amount of sand vs. silt vs. clay as well as organic matter. The organic matter rating is 3.14 which is considered relatively high. The water-soluble Carbon and water-soluble C:N ratio are optimal indicating there the soil is not "carbon exhausted". The ratio of K (Potassium) to Ca + Mg (Calcium and Magnesium) is optimal which is an important score for animal grazing health. Soil pH is 6.39. Most plants are not affected by soil pH unless it is very high or very low.



- **Technical Interpretation by NRCS Relative to Conservation Objectives:** Given that the fields currently contain alfalfa, it is likely that the low soluble Nitrogen score and optimal estimated biological and total potential Nitrogen are optimal, it is likely that Nitrogen is being fixed by the alfalfa and not circulating in the system. This may also relate to the moderately high soil fertility score and lower soil health score. Phosphorus and Potassium are quite high; this could be either from the soil parent material or high applications of Phosphorus and Potassium fertilizer in the past. The soil bulk density is low which is tied to soil texture and organic matter. However; we textured the soil out as a loam and the soils have relatively high organic matter. The way in which the test is performed may be skewing the result. All other scores are medium or optimal and no limiting factor has been identified.

- **Recommended Practices:** When the NRCS visited the alfalfa field for testing, we conducted a soil compaction test as well. We identified a dense compaction layer at approximately 6 inches that likely resulted from a plow plan. This layer has been broken up by ground squirrels and pocket gophers in some areas which may explain why the alfalfa is more robust in certain areas but not others. The soil health test has also indicated that soil Nitrogen is likely not being cycled through the soil efficiently. We suspect that once soil compaction is addressed, the alfalfa will improve its vigor and the available Nitrogen will increase. Soil compaction can be addressed in multiple ways. The NRCS recommends planting a cover crop that addresses compaction. This will include several deep rooting plants such as radishes. A cover crop could also act as a transition crop for a new alfalfa planting. The current alfalfa is likely at the end of its viable lifespan.

- **Practices Put in Place:**

- **Follow up:**
 - **Date:**
 - **What is working:**
 - **What is needed:**