A collaboration between:

Soil Test Sampling

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Time of sampling

- Soil samples can be taken at any convenient time during the year. Test values for pH, phosphorus (P) and potassium (K) tend to be slightly higher in early spring samples than in fall samples [2].
- To monitor the contents of available nutrients over the years, samples should always be taken during the same season.
- Samples need to be taken before fertilizer is applied to the next crop.
- A field should be tested every 3-5 year, preferably between the same two crops in the crop rotation. This allows monitoring changes in nutrient status over time and evaluating the adequacy of the fertilizer program [2].

Taking a representative sample

- When soil properties or plant development differ within a field, the field should be divided into different management areas with similar characteristics and a sample from each area should be taken [5].
- A convenient way to check for differences in soil properties is to use the interactive application SoilWeb (available at **http://casoilresource.lawr.ucdavis.edu/soilweb/**). For Figure 1, the application was used for a field near Davis, CA. For this field, separate samples should be taken from the area with Brentwood silty clay loam (BrA) and from the area with Myers loam (Ms). The central and right section of the field should be sampled separately if their management differs.
- If it is not clear whether textural changes or differences in the crop history are pronounced enough to affect nutrient availability, it is a good idea to sample the different areas separately. If the soil analyses indicate that the areas are similar, they can be treated as one management area in future sampling events.

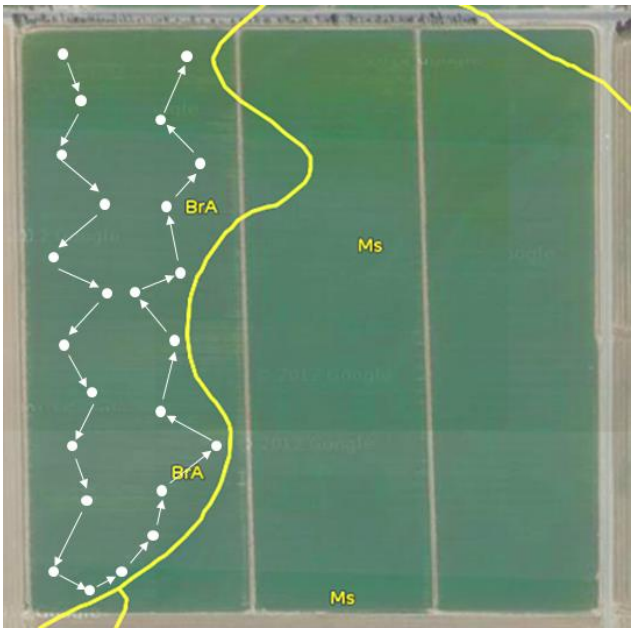

Figure 1: Soil sampling plan for a representative sample from a field or management area. The Picture is a screenshot of a field from Google map using the SoilWeb application.

- For a representative sample, a minimum of 20 cores needs to be taken for one sample [5].

- Do not sample where fertilizer has been applied recently, do not sample unusual areas, such as corners or edges of former fields or fence rows that are now in the field, and remove surface crop residues before taking a core [4].
- Care must be taken, when sampling fields where fertilizer was band-applied. When the location of the bands is known, it is best to either avoid the bands [1] or to sample the band one time for every 20 cores taken [4]. If the location of the bands is not known, pairs of random samples can be taken. The first sample is taken at a random spot, the second half a band spacing distance away at a right angle to the bands [4].
- Crop management may lead to differences in nutrient availability within a field over time. For example, the application of lagoon water with flood or furrow irrigation may result in differences between the top and the bottom of the field. Leveling of fields may also cause differences between areas were topsoil was removed and areas where this soil was spread. Areas that may differ should be sampled separately. If the soil analyses show no difference, they can be sampled together in the future.

Sampling procedure

- Take samples with a sampling probe or auger.
- The top 6 inches or the depth of tillage are generally sampled [1]. In no-till fields, a sampling depth of 3-4 inches is sufficient [4].
- Cores are taken from the entire area of the field or management area in a W-shaped sampling pattern or by walking a zigzag course around or through the area as shown in Figure 1 for the Brentwood soil.
- To monitor the soil fertility level over time, it is important to always take samples from a field to the same depth [2].
- A minimum of 20 cores needs to be composited for a representative sample [5].
- Collect the samples in a clean plastic bucket [5]. Galvanized or rubber buckets may contaminate samples with zinc [3, 4].

Sample handling

- When all the cores for an area are taken, mix them thoroughly.
- Very wet samples should be air-dried before packaging [1]. Do not dry the samples in an oven or at abnormally high temperature [4].
- Place the sample into a clean plastic bag and label it clearly. Follow the instructions of the laboratory the sample will be sent to.
- To receive accurate fertilizer recommendations, the sample information sheet needs to be filled out carefully [4]. Include the information sheet within the package [1, 2].

References

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This document is available online at https://apps1.cdfa.ca.gov/FertilizerResearch/docs/Soil_Sampling_P_K.pdf

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