

SAMPLE PREP SPLIT STUDY - FERTILIZERS

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MT Department of Agriculture lab

- Small Lab
- Feed, Fertilizer Pesticide testing LAB
- Currently accredited in 8 methods
- Receive approximately 2,500 samples per year



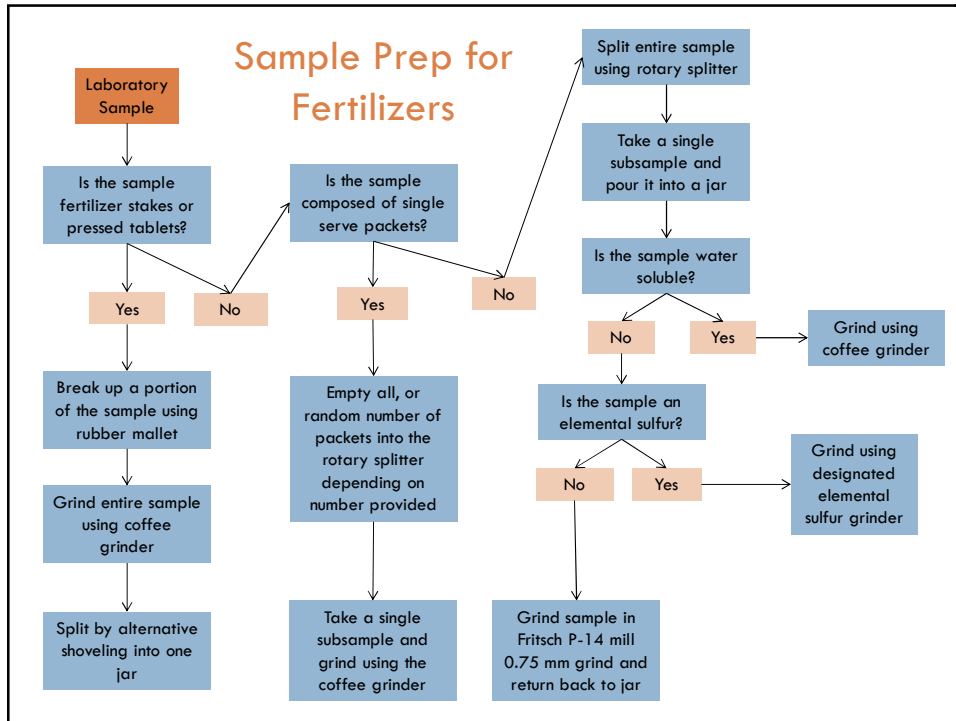
2015-2016 Fertilizer Season

- 232 fertilizer samples
- 43 deficient samples
 - ▣ 13 - 2015
 - ▣ 30 - 2016
- Some samples were deficient for more than one component



Breakdown of Fertilizer Types

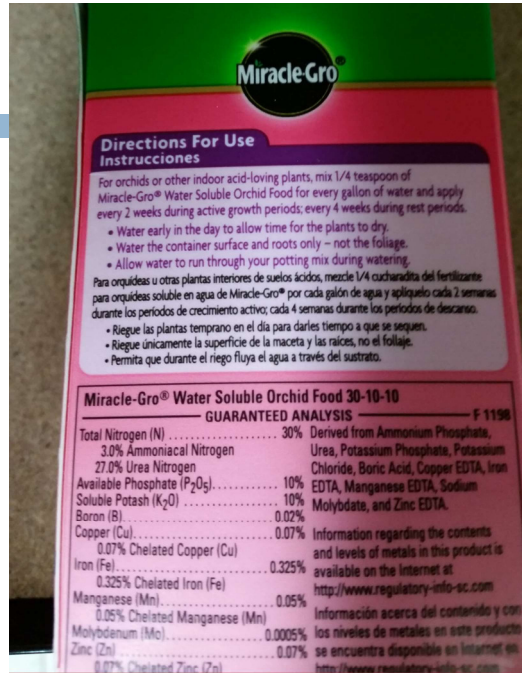
Sample Type	Form
Base Fertilizer	Bagged
Liquid Fertilizer	Bulk
Blended Fertilizer	Other
Specialty Fertilizer	



Standard Approach

- Samples can be very non homogenous!
- Mass reduction to a subsample/split with a mechanical splitter
 - 2015 – riffle
 - 2016 – rotary
- Samples typically range from 2-4 pounds
 - Sample split down to ~1/30 of original amount for testing
- Sample split ground with Fritsch Pulverisette 14
 - 0.75 mm grind
- Remaining sample is reserved in case further testing is needed

Label Claim



Deficient Sample Process

AB60612	4.21.16	bulk	blended fertilizer	rotary	35.90%	TKN-1	←	1	34.6		
						TKN-1	←	2	35.32	34.96	←
						TKN-2	←	2	35.99		
						DUP-2	←	2	35.34	35.665	←
						reported			35.3	35.313	2.00

1. The first split is tested during the initial run (run-1)
2. If deficient, a second split is obtained and the first and second split are tested together in run-2
3. Often a duplicate of split-2 is also analyzed during run-2
4. An average of each split is calculated
5. An average of the sample splits is calculated.
6. The relative percent difference is calculated between the split values

Average %RPD

Good Performers

Component	N	%RPD Average
K2O	12	3.12
P2O5	12	3.32
TKN	9	2.81

Average %RPD

Poor Performers

Component	N	%RPD Average
Sulfur	8	4.45

Comparing Results of Splitters

- 2 different splitters used
 - Riffle – used for 2015 portion of fertilizer season
 - Rotary – used for 2016 portion of fertilizer season

Splitter	N	%RPD Average	%RPD STDEV
Riffle	14	4.02	4.46
Rotary	37	2.84	3.67

Conclusions

- Rotary better than riffle
- %RSD reasonable
- Comparable to replicate testing
- Efficient process



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*“Science does not know its debt to
imagination.”*

Ralph Waldo Emerson

