

DTA Soil Microbial Structure Guide

Start with a Soil Test

- We need the following sampled: Organic Matter, P2, K, Mg, Ca, CEC, S, Cl, N: test Nitrate, (TKN), Ammonia N, and Organic N, Base Saturation: K, Mg, Ca, Na
- The above samples should be run a minimum of every three years.
- Run PT2 on several samples to see what the true levels of minerals are.
- Soil Health (Haney Test) should be run (Mid July – Mid Aug) to monitor progress on the program.

Monitor Acidity

pH is an accurate assessment of acidity chemically. It, by itself, isn't a good way to monitor acidity biologically. We look at the pH:CEC Ratio. The formula is:

$\text{pH:CEC Ratio} = \text{pH}/\text{CEC} + ((\text{OM} - 2) / 100)$. A ratio above a .4 is conducive to microbial life and the addition of our microbial rich program.

Correct Acidity

If we are below a .4 on the pH:CEC ratio one of several things needs to happen.

- ❖ Do one of the following:
 - Apply 1000# /acre of hi calcium low magnesium ag lime for two consecutive years
 - Grow a spring cover crop which produces CO₂ (natural buffer).
 - Apply 2-4 ton of dry manure. This will create carbonic acid (liquid manure doesn't serve as a buffer because of the high level of hydrogen).
- ❖ Retest year 3 and monitor progress.

Correct Magnesium

Soils with magnesium above 17% base saturation are generally tight and compact easily. We have seen a benefit of applying Gypsoil.

- Apply 1-ton Gypsoil for two consecutive years. Approved for conventional acres only.
- Retest year 3 and monitor progress.

On organic production.

- Use Sulfur through Calcite Turbo S and Organic Living Carbon S
- Be prepared to do fall sub soiling.

Address Compaction

Chloride is an indication of how well water is percolating through the soil. Monitor chloride levels to determine where compaction is at:

- 0-5 Compaction usually not present.
- 6-10 Usually not present but fields to observe.

- 11 + Check for compaction and mechanically address.

The above basic principles need to be addressed before truly entering a microbial program. Biology is a powerful force, but it needs an atmosphere in which to live.

The Program

The program is centered around structured calcium (calcite) and biology (manure). If you have manure, that is where we start. If you don't, we provide it in the form of our Living Carbon product.

Farm owned manure:

We start out with a 500 # application of Calcite Turbo S (CTS) or 275# of Organic CTS on all manured or compost-applied soil. Ideally, top applied manure or compost should be worked into the soil within 24 hours to limit carbon burn off. Our rate recommendations are as follows.

Liquid Dairy or Beef

- 5000 gallons per acre

Swine

- 3000 gallons per acre

Dry manure, compost, or poultry manure

Soil CEC 1-5

- 2 to 4-ton dry manure, compost, or poultry manure

Soil CEC 6-8

- 1 to 2-ton dry manure, compost, or poultry manure

Soil CEC 9-35

- 1/2 to 1-ton dry manure, compost, or poultry manure

No farm owned manure:

Living Carbon is the product we use when there is no owned manure. Living Carbon brings in both the biology and the structured calcium in one package. The rate will vary between 500 and 1000# per acre. It is essential that Living Carbon is either applied onto a cover crop or worked into the soil within 24 hours. It is vital that Living Carbon is not sitting on bare soil surface for longer than 24 hours. On all soils, but particularly low CEC soils (under 9), we recommend the use of a cover crop. This will enhance organic acids and soil biology.

Crop specific recommendations

Corn

Corn planting depth should be 2"

Apply:

- ❖ Manure/CTS at the recommended rate or Living Carbon at a rate of 500# / acre
- ❖ 6 ¼ gallon blend including the following, on seed in row.
 - 3 gallons of 8-22-2.25 Zn or equivalent starter. Approved on conventional only.
 - 3 gallons of Liquid Living Carbon (LLC)
 - 1 quart of Soil Release with worm casting extract
- ❖ Side dress at planting either a protected nitrogen (40# N actual) or 1 quart N-Hold with 5 gallons of 28% or 32% liquid nitrogen.
- ❖ Final nitrogen needs should be applied 5-6 weeks after planting. Take TKN credit (see chart below) off of the normal rates you would use.
- ❖ Recommend foliar application of 3 gallons of LLC before tasseling.

Take compacted areas and continuous corn on corn into consideration with nitrogen recommendations.

		TKN	
TKN	Yr 1 Credit	Yr 2 Credit	Yr 3 Credit
	20%	38%	55%
700	32	61	89
800	37	70	101
900	41	79	114
1000	46	87	127
1100	51	96	139
1200	55	105	152
1300	60	114	164
1400	64	122	177
1500	69	131	190
1600	74	140	202
1700	78	149	215
1800	83	157	228
1900	87	166	240
2000	92	175	253
2100	97	184	266
2200	101	192	278
2300	106	201	291

2400	110	210	304
2500	115	219	316

On Organic Corn

- ❖ 3¼ gallon blend including the following, on seed in row
 - 3 gallons of Liquid Living Carbon (LLC)
 - 1 quart of Soil Release with worm casting extract
 - Add non-chlorinated water to desired rate
- ❖ Foliar apply 3 gallons of LLC before tasseling.

Beans

Beans should be planted at 1 ¼”.

Apply:

- ❖ Manure/CTS at the recommended rate or Living Carbon at a rate of 750# / acre
- ❖ 3¼ gallon blend including the following, on seed in row
 - 3 gallons of Liquid Living Carbon (LLC)
 - 1 quart of Soil Release with worm casting extract
 - Add non-chlorinated water to desired rate
- ❖ Foliar apply 3 gallons of Liquid Living Carbon at flowering

New seeding Alfalfa

Apply:

- ❖ Manure/CTS at the recommended rate or Living Carbon at a rate of 1000# / acre
 - Best applied at seeding or after first cutting.

Alfalfa

Apply:

- ❖ Manure/CTS at the recommended rate or Living Carbon at a rate of 1000# / acre

Small Grains

Apply:

- ❖ Manure/CTS at the recommended rate or Living Carbon at a rate of 500# / acre
- ❖ 3¼ gallon blend including the following, on seed in row
 - 3 gallons of Liquid Living Carbon (LLC)
 - 1 quart of Soil Release with worm casting extract
 - Add non-chlorinated water to desired rate
- ❖ Apply nitrogen at normal levels, reduce nitrogen year 2

Last Revised March 3, 2018