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Soil Respiration Rate

By:

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Introduction

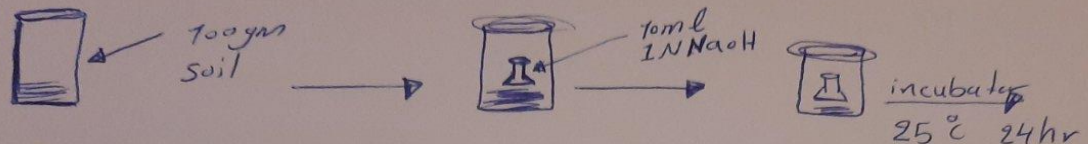
- Soil respiration is production carbon dioxide (Co_2) as a result of biological activity in the soil by micro organisms and macro organism
- Mgc-co2/g soil/day, MgCsoil hr or mg

- **Factors effecting on SSR:**
- 1) soil color: soil color may provide some assistance when interpreting respiration rate.
- A) light colored soil/ with high respiration rate, may be indicator of soil being depleted of organic matter
- B) dark colored soil /could be consider healthy soil, the dark color indicates the presence of organic matter

- 2)Tillage or cultivation :increase of CO_2 released which creates better accessibility of O_2 necessary for organic matter decomposition and respiration resulting in CO_2 released.
- 3) Temperature: since respiration is an enzyme mediated biological process carried out by bacteria and fungi its very sensitive to temperature (the ideal media for respiration it was at 25^0C)
- 4)Soil moisture:affectes the activity organisms very dry and very wet conditions tend to reduce respiration rate.
- 5) quality and quantity of organic matter: The organic matter can influence the rate of decomposition
- 6)Oxygen: it is the most limiting in the soils that are saturated with water.greater O2 flow occurs in well aggregated soils that have many macropores.soil organic matter decomposes are aerobic.

- **Determination of soil respiration rate in soil**
- **Reagent:**
- 1-HCL
- 2-NaOH(1N)
- 3-phenolphthalin indicator

- **Procedure:-**
- Add 100gm of soil into glass bottle then put small conical flask inside glass bottle ,added 10 ml of 1N NaoH to the conical flask ,close cover of glass bottle then put in incubator 25^0C for 24hr.
- After incubate add 2-3 drops of ph.ph indicator.
- Titrate with HCL solution and swirling the flask continue the titration until the colorless develops and take the reading.
- **$BAS=\{(Mc*Vb-Vs)*M_{HCL})/(S_{wt}*t*2)\}*10^3$**



after incubate → 2-3 drop ph.ph indicator → then → titrate with HCl until colorless develop

$$BAS = \frac{Mc * (Vb - Vs) * 0.05}{Sdw * t * 2} * 10^3$$

V = blank 10.1

V. soil 8.3

$$BAS = \frac{12.01 * (10.1 - 8.3) * 0.1}{100\,(g) * 24 * 2} \times 10^3$$

Thank You