PRO AGRO LECTORIUM

INTEGRATED NUTRIENT MANAGEMENT IN IMPROVING CROP PRODUCTION

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INTEGRATED NUTRIENT MANAGEMENT TO IMPROVE CROP PRODUCTION

- Integrated nutrient management (INM) is a set of practices combined together to supply required nutrients to plants.
- Soil fertility in many semi-arid areas across the world is low.
- Farmers apply inadequate nutrient sources and this causes poor crop yields.

INTEGRATED NUTRIENT MANAGEMENT TO IMPROVE CROP PRODUCTION (continued)

- To improve soil fertility and crop production there is need to adopt INM.
- INM involves combination of organic and inorganic nutrient sources.
- Organic nutrient sources include animal manure, compost, agroforestry biomass and organo-mineral fertilisers.

BENEFITS OF INM

- Enhances plant productivity.
- Reduces the cost of mineral fertilizer inputs.
- Provides balanced nutrition to crops.
- Promotes carbon sequestration and maintains soil health
- Increases microbial population needed for nutrient cycling.

BENEFITS OF INM (continued)

- Prevents leaching of nutrients, water and deterioration of soil.
- Increases crop yield and quality.
- Reduces ammonia emissions and improves air quality and human health.
- Productivity gain, increased resilience and mitigation to climate change.

YIELD BENEFITS OF INM IN SEMI-ARID AREAS

- In many semi-arid areas maize yield is <1000 kg/ha but with use of INM it can be increased up to 4500 kg/ha depending on soil and climate.
- Sorghum grain yield ranges from 200-400 kg/ha and with INM farmers can realise 1200-2500 kg/ha.
- INM makes nutrient readily available to plants that increases crop growth and yield.
- In Kenya, the use of INM including cattle manure + Leucaena biomass + 30 kg N/ha increased maize grain yields from 700 kg/ha to 4500 kg/ha.
- In Zimbabwe, the use of *Leucaena* biomass + 100 kg NPK/ha improved sorghum grain yield from 450 kg/ha to 1150 kg/ha.

YIELD BENEFITS OF INM IN SEMI-ARID AREAS: A Review

Treatments	Country/ Region	Experimental year	Soil texture	Crop	Yield (kg ha^{-1})	References
2.5 t ha^{-1} cattle manure	Zimbabwe	2019	Sandy loam	Potato	21000	Rumbidzai *et al.* (2022)
2.5 t ha^{-1} cattle manure + 25 kg ha^{-1} K_2O	Zimbabwe	2019	Sandy loam	Potato	22610	Rumbidzai *et al.* (2022)
2.5 t ha^{-1} cattle manure + 50 kg ha^{-1} K_2O	Zimbabwe	2019	Sandy loam	Potato	26800	Rumbidzai *et al.* (2022)
5 t ha^{-1} cattle manure	Zimbabwe	2017/18; 2018/19	Sandy loam	Maize	2340; 2420	Tapiwa *et al.* (2020)
5 t ha^{-1} cattle manure + 100 kg ha^{-1} N	Zimbabwe	2017/18; 2018/19	Sandy loam	Maize	3120; 3260	Tapiwa *et al.* (2020)
Cattle manure + 30 kg N ha^{-1}	Kenya (Chuka)	2000-2003	Sandy clay loam	Maize	4700	Mucheru-Muna *et al.* (2007)
2.5 t ha^{-1} Cattle manure + 41 kg N ha^{-1} + 46 kg P_2O_5 ha^{-1}	Mali	2012/13	Sandy Loam	Pearl millet	1370	Coulibaly (2015)

SORGHUM UNDER INM IN ZIMBABWE

(2018/19)

(2019/20)

MAIZE AND GROUNDNUTS UNDER INM IN ZIMBABWE

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Thank you!