



**USE OF ALTERNATIVE FERTILIZER SOURCES
IN MARGINAL LANDS OF TROPICAL AMERICA**

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O B J E C T I V E S

1. TO EVALUATE IN ACID SOILS ($\text{pH} < 5.5$) THE RELATIVE MERIT OF LOW SOLUBILITY, LESS COSTLY SOURCES OF K, Mg AND S SUCH AS K-FELDSPARS, Mg-SERPENTINE OR CARBONATES AND GYPSUM OR ELEMENTAL SULFUR.
2. TO DETERMINE THE MOST APPROPRIATE COMBINATIONS OF RATES AND PLACEMENT METHODS IN TERMS OF INITIAL AND RESIDUAL EFFECTS ON TROPICAL PASTURES (FOOD CROPS).

ACTUAL FERTILIZER TECHNOLOGY VS. AGRICULTURAL TECHNOLOGY FOR MARGINAL LANDS

LOW COMPATIBILITY

EDAPHIC

- WATER SOLUBLE (LEACHING)
- SHORT RESIDUAL EFFECT (K,Mg)
- HYGROSCOPE
- ETC.

AGRONOMIC

- AGRICULTURAL SYSTEMS (INTENSIVE VS. EXTENSIVE)
- FERTILIZER MANAGEMENT
- TIME OF APPLICATIONS
- ETC.

ECONOMIC

- TRANSPORT
- STORAGE
- COST OF PRODUCT
- ETC.

FERTILIZER PRODUCTION AND CONSUMPTION IN SEVERAL COUNTRIES OF TROPICAL AMERICA
DURING 1980/81. (THOUSAND METRIC TON: N-P-K)

Country	N		P		K	
	Production	Consumption	Production	Consumption	Production	Consumption
BRAZIL	384	906	708	867	0	1089
COLOMBIA	42	152	20	33	0	63
ECUADOR	2	41	3	6	0	15
PERU	74	82	0,5	7	0	9
VENEZUELA	145	113	10	34	0	42

SOURCE: FAO, Fertilizer Yearbook, 1982.

TYPICAL MINERAL COMPOSITION OF K-FELDSPAR ROCKS FROM
HUILA, COLOMBIA

MINERAL COMPOUND	CONTENT (%)
SiO ₂	72.63
Al ₂ O ₃	15.69
Fe ₂ O ₃	0.21
TiO ₂	0.14
P ₂ O ₅	0.26
CaO	0.78
MgO	0.42
MnO	0.01
Na ₂ O	1.78
K ₂ O	7.61
SO ₃	0.47
K-FELDSPAR (K ₂ O·Al ₂ O ₃ · 6 SiO ₂)	45.01%
Na-FELDSPAR (Na ₂ O· Al ₂ O ₃ · 6 SiO ₂)	15.05%

RELATIVE AGRONOMIC EFFECTIVENESS OF SEVERAL K-FELDSPAR ROCKS AS DETERMINED
 BY THE YIELD OF *Brachiaria decumbens* GROWN IN A CARIMAGUA
 OXISOL AT THE GREENHOUSE

Potassium Source	Potassium rates (Kg K/ha eq.)			
	10	20	40	80
	(7.6)	(7.8)	(7.7)	(8.6)
KCl*	100a	100a	100a	100a
Algeciras 1	64c	91a	91a	97a
Rio Blanco	95a	87b	95a	107a
Algeciras 2	90a	90a	96a	77b
Ospina	101a	85b	95a	87b
Hobo	86b	87b	80b	94a

Means in the same column and with the same letters are not different ($P < 0.05$)

* Yields of the KCl treatments are assumed 100% at each K rate; numbers in parentheses are yields in g/pot.

Control: (4.0)

**ALTERNATIVE SOURCES OF NUTRIENTS FOR ACID, INFERTILE OXISOLS AND
ULTISOLS IN MARGINAL LANDS OF TROPICAL AMERICA**

- DO NOT NECESSARILY INVOLVE REDUCED QUANTITIES OF FERTILIZERS, BUT DO INVOLVE FERTILIZER WITH REDUCED COST.
- DO INVOLVE USE OF INDIGENOUS RATHER THAN IMPORTED INPUTS.
- DO INVOLVE UTILIZATION OF RESIDUALLY AVAILABLE NUTRIENTS FOR LONG TERM MAINTENANCE OF PASTURES AND/OR CROPS.

R E S E A R C H P R I O R I T I E S

MINERALOGICAL STUDIES:

- DESCRIPTION AND DETERMINATION OF MINERAL COMPOSITION OF THE ROCKS
- NUTRIENT RELEASE RATES
- MINERAL DIGESTIBILITY
- THERMAL TRANSFORMATIONS
- NUTRIENT CONCENTRATION PROCESSES
- ETC.

RESEARCH PRIORITIES

AGRONOMIC STUDIES:

- AGRONOMIC POTENTIAL OF INDIGENOUS K, Mg AND S RESOURCES IN TROPICAL AMERICA
- AGRONOMIC EFFECTIVENESS OF K, Mg AND S SOURCES AS INFLUENCED BY CROP/SOIL PROPERTIES
- EFFECTS OF PHYSICAL (GRANULAR SIZES) AND CHEMICAL MODIFICATIONS TO THE INDIGENOUS FERTILIZER SOURCES ON THEIR AGRONOMIC POTENTIAL
- COMBINATIONS OF RATES AND PLACEMENT METHODS IN TERMS OF INITIAL AND RESIDUAL EFFECTS AS INFLUENCED BY CROP/SOIL PROPERTIES