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Organic Fertilization of Sorghum Seeds for Forage for Use by Monogastric and Ruminant Livestock

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Organic fertilization of Sorghum seeds for forage for use by monogastric and ruminant livestock

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Key words : plastic bags , seeds , sorghum , fertilizing organic

Introduction The use of organic wastewater in agriculture to fertilize different crops is one of the more acceptable alternatives to provide an environmentally safe way to dispose of these contamination sources . However is it very important to take into account the optimal wastewater doses according to the international guidelines (Cairncross and Mara , 1990) . The measurement of these parameters are done by chemical and microbiological analysis and also by using some indicator plants . In Cuba , technical rules to regulate the use of swine wastewater in agriculture do not exist . The aim of this paper to was define the optimal application rate of swine wastewater as organic fertilizer of a Sorghum bicolour UDG-110 crop by means of a practical and easy method in plastic bags .

Materials and methods The experiment was carried out in polythene plastic bags (2 kg capacity) distributed in three treatments (doses of swine effluent) , 10% (T1) , 20% (T2) and 30% (T3) with 10 replications each one in a randomized complete block design . A no-water or fertilizer control was included . (C) . The organic fertilizer of the swine effluent comes off a fixed dome anaerobic biodigester of 15 m^3 . Three seeds of Sorghum were planted in each bag to 5 cm deep . The dry matter (DM) , organic matter (OM) , N , P , K and pH of soil and effluent were measured at the beginning and also was analyzed the effluent microbiological composition . The heights of the plants were measured every 5 days over a total period of 30 days . The chemical analyses were done following standard procedures of the Association of Official Analytical Chemists procedures and the microbiological analyses . In the statistic study , all microbiological results were transformed to $Log_{10}(x+1)$ and analysis of variance were made according to Steel (et al ., 1997) .

Results and discussion Treatment 2 (20 % of swine wastewater) germinated faster than the rest of the treatments and the control ($P<0.01$) . The biomass at 30 days and its chemical composition were higher for the treatment 2 , and similar performance was evidenced for the altitude and number of leaves of this crop in this treatment , Table 1 and 2 .

Table 1 *Biomass weight to the 30 days . DM (g) .*

	Leaves weight	Stems weight	Roots weight	SE±
Control	4 ,08	3 ,44	0 ,63	0 ,23
10%	3 ,86	3 ,21	0 ,64	0 ,19
20%	5 ,99	5 ,21	0 ,78	0 ,21***
30%	3 ,38	2 ,72	0 ,66	0 ,10

*** $P<0.001$

Table 2 *Chemical composition of the biomass for each treatment .*

Indicators	Control	10%	20%	30%	SE±
DM	15 ,94	14 ,96	20 ,64	15 ,09	1 ,01*
CZ	35 ,05	36 ,18	35 ,56	35 ,01	0 ,23
pH	7 ,01	7 ,06	7 ,1	7 ,03	0 ,58
N	0 ,700	0 ,750	2 ,080	0 ,450	0 ,16**
P	0 ,064	0 ,070	0 ,092	0 ,061	0 ,28**
K	0 ,190	0 ,220	0 ,290	0 ,200	0 ,22*

* $P<0.05$ ** $P<0.01$

Conclusions The 20% of anaerobic effluent as organic fertilizer was the optimal dose to fertilize this cereal . With the application of this method using plastic bags , it is possible to define the reliable limits of the use of residual organic as fertilizers in the agriculture , results obtained for other authors (Chantaprasarn , 2003) .

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