BOCASHI FERTILIZER FROM WHEY, ORGANIC WASTE AND ANIMAL MANURE WITH YEAST SACCHAROMYCES CEREVISIAE

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Introduction. The Bokashi is a mixture of plants, cereals, oilseeds and animal meal fermented with microorganisms (bacteria, yeasts, actinomycetes and fungi of the genus *Aspergillus* and *Penicillium*) whose objective seeks to raise soil microbial life improving it and fertilizing it also favoring nutrition plant (1,2,4,5). Their chemical composition depends on the process and its duration, biological activity and material types. (3). The objective was to examine the physical, chemical and microbiological compost from whey, gallery waste, animal manure with different proportions of yeast Saccharomyces cerevisiae.

Methods. The design consisted of five treatments with four replications, we varied the ratio of yeast and molasses, holding constant the other, they were: T0 = chicken manure, bobine and ovine, organic waste (cauliflower, chard, broccoli, lettuce), rice bran , fertile soil, charcoal, molasses, water, lime, whey, T1: 0.05% yeast - 1.97% molasses, T2: 0.07 2.76% yeast-molasses; T3: 0.09% yeast -3.55% molasses; T4: 0.11% 4.34% yeast-molasses. Statistical analysis was ANOVA with Tukey test (p <0.05).

Results. In Figure 1, for 22 and 34 days the temperature was increased in yeast treatments with temperatures around 34 to 37 ℃. While (T0) showed a temperature of 40 ° C on day 38.

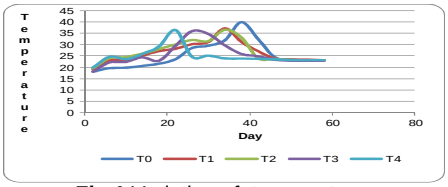

Fig.1 Variation of temperature

At sat time Table 1 shows significant differences for organic matter, pH-T0-presented difference from the other treatments; differed Nitrogen and Phosphorus in T4 and T0 respectively, while T0 and T1 Potassium. Table 2 shows the differences: Ca (T0, T1, T2), Mg-Mn (T0, T1) Cu-Zn-Fe (T0) with respect to moisture treatments show no difference. The final yield of product obtained was 66%, particle diameter = 2 mm.

Table 1. Chemical variables

Variable/treatment	T0	T1	T2	T3	T4
pH	7,5 a	6,4 b	6,3 b	6,2 b	6,1 b
Organic matter (%)	29,8 a	39,5 b	40,5 c	42,3 d	42,8 e
N (%)	1,36 a	1,29b	1,33ab	1,37ab	1,42c
P (%)	3,24d	0,64a	0,67ab	0,69abc	0,7bc
K (%)	1,96d	1,31c	1,42a	1,45ab	1,47b

Rows with the same letters are similar a p<0,05. STATGRAPHICS

Table 2. Chemical and physical variables

Variable/treatment	T0	T1	T2	T3	T4
Ca(%)	10,55d	8,22c	8,45b	8,51a	8,56a
Mg(%)	0,96d	0,66c	0,7a	0,73ab	0,75b
Fe(%)	0,3645d	1,1115a	1,122ab	1,1223abc	1,1233abc
Mn(%)	0,027d	0,029c	0,034a	0,035ab	0,0356ab
Cu(%)	0,0112d	0,0032a	0,004ab	0,0045bc	0,0049bc
Zn(%)	0,0144d	0,0174a	0,0174ab	0,0175abc	0,0176abc
Moisture(%)	45a	43a	44a	44,2a	44a

Rows with the same letters are similar a p<0,05. STATGRAPHICS

Table 3. Microbiological analysis

Microorganism in Log UFC/g	T0	T1	T2	T3	T4
Aerobic mesophilic	1,5d	8,5a	8,3ab	8,4abc	8,5abc
fungi and yeasts	1,5d	8,2c	8,5a	8,7ab	8,9b
Actinomycetes	1,5d	6c	6,2a	6,3ab	6,4b
Lactobacillus	1c	3a	3,1a	3,3b	3,4b

Rows with the same letters are similar a p<0,05. STATGRAPHICS

Conclusions. Yeast shortest time possible to achieve in the mesophilic stage, and a representative population of beneficial microorganisms (see Table 3), the raw materials used are subject to significant contributions biodegradation micro and macro minerals.

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References.

1. CUESTA, M. (2002). Organic agriculture and development dimensions. XIII Congress of INCA. Agrarian University of Havana. 54 p.
2. JEAVONS, J. (2002). Grow More Vegetables. Ecology actions of the Midpeninsula. USA. 261 p.
3. MELENDEZ, G. (2003). Chemical indicators of quality organic fertilizers. In: Organic fertilizers: Principles, characteristics and impact on agriculture. Ed Melendez, G. San Jose, Costa Rica. pp. 50-63.
4. SOTO, M. (2003). Organic fertilizers: definitions and processes. In: Organic fertilizers: principles, applications and impacts on agriculture. Ed Melendez, G. San Jose, Costa Rica. pp. 20-49.
5. PANEQUE, V. M., CALAÑA, J. M. (2004) Organic Fertilizers, practical concepts for evaluation and implementation. Technical Brochure. Cuban Association of Agricultural and Forestry Technicians. Havana, Cuba. 54 p.