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RABBIT BREEDING AS A SUSTAINABLE PRODUCTION ALTERNATIVE IN THE ITAMARATI / MS SETTLEMENT

CRIAÇÃO DE COELHOS COMO ALTERNATIVA DE PRODUÇÃO SUSTENTÁVEL NO ASSENTAMENTO ITAMARATI/MS

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ABSTRACT: Energy residues from livestock represent a valuable and available resource for the agronomic sector, mainly in organic agriculture, which requires non-chemical fertilization. Thus, animal waste when used appropriately has the potential to replace the fertilizers commonly used, due to their valuable nutritional composition for vegetables. Cuniculture is an activity that presents several benefits, co-products, and by-products, such as feces that can be transformed into organic substrates used for fertilization. To use these wastes, as of January 2020, an initiative was implemented in the creation of rabbits in the community with the donation of females capable of reproduction, from the Experimental Farm of Agricultural Sciences at UFGD. In addition to donations, the emphasis was placed on composting the waste to be used in the garden. Monitoring of the production of the settlement was carried out and until the present date, the animals continue to receive vegetables daily as a complement to their food and the collection of manure and compost has already been carried out. It can be seen that rabbit farming gains extreme social and environmental importance, as it can contribute to the improvement of the population's diet by offering a high-quality nutritional source of protein and through the composting of organic waste

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produced by farming that makes the production of vegetables possible. organic. The manure from the production of rabbits proved to be highly efficient for the production of vegetables in an agroecological system, ensuring greater sustainability in the cycle of animal and vegetable production.

KEYWORDS: Cuniculture, Rural Extension, Waste, Horticulture.

RESUMO: Os resíduos energéticos oriundos da pecuária representam um recurso valioso e disponível para o setor agronômico, principalmente na agricultura orgânica, que demanda fertilização não química. Dessa forma os dejetos dos animais, quando utilizados de maneira apropriada, tem o potencial de vir a substituir os fertilizantes comumente utilizados devido a sua valiosa composição nutricional para os vegetais. A cunicultura é uma atividade que apresenta vários benefícios, coprodutos e subprodutos, como suas fezes que podem ser transformados em substratos orgânicos utilizados para adubação. Com intuito de verificar o aproveitamento destes dejetos, estes foram coletado da criação de coelhos implementada no Núcleo de Agroecologia do Assentamento Itamarati com a doação de fêmeas aptas à reprodução, oriundos da Fazenda Experimental de Ciências Agrárias da UFGD e foi dada ênfase a compostagem dos dejetos para serem usados na horta. Foi realizado um acompanhamento da produção do assentamento de janeiro a abril de 2020 e os animais continuam recebendo diariamente hortaliças como complemento em sua alimentação e já foi efetuada a coleta de dejetos e compostagem. Pode-se observar que a cunicultura ganha extrema importância social e ambiental, pois pode contribuir para melhoria da alimentação da população, pois, além de oferecer uma fonte proteica de alta qualidade nutricional oriunda de sua carne, por meio compostagem de restos orgânicos produzidos pela criação, viabiliza a produção de hortaliças de modo orgânico. O esterco oriundo da produção de coelhos se mostrou altamente eficiente para produção de vegetais em sistema agroecológico, garantindo maior sustentabilidade no ciclo de produção animal e vegetal.

PALAVRAS-CHAVE: Cunicultura, Extensão Rural, Dejetos, Horticultura.

INTRODUCTION

The Agroecology Center of the Itamarati Settlement, in the municipality of Ponta Porã, MS was created in 2006. Its creation was motivated after a visit by some producers to the Creole Seeds and Organic Products Fair held in the municipality of Juti, MS. In this visit, after hearing several lectures focusing on the theme organization, the interest and the need for differentiated work was aroused with emphasis on organic agriculture. This deviation of vision occurred in a generalized way by the community settled in the Itamarati Settlement,

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composed of almost 3,000 families in their two phases of implementation known as Itamarati I and Itamarati II (NEVES & KOMORI, 2011).

The source of income of farmers is characterized by an integrated contribution of resources obtained through production systems of the property and with incomes external to it (SCHEMBERGUE et al., 2017). The cultivation of food is often both for subsistence and for marketing. In the case of subsistence production, consuming the product that is planted reduces the consumption demand in the market and, therefore, reduces family expenses per property. In addition to this, when using the residues of this crop for animal husbandry, it can further reduce family expenses and with its commercialization may increase its income (ZACHOW et al., 2018).

It should not be mentioned that the search for natural fertilization processes, without chemical fertilizers and pesticides, has been constant in agrarian sciences (CARVALHO et al., 2017) and waste from rabbit breeding can be inserted in this context. The use of this material as fertilization can bring generous economic, socio-environmental, and sustainable benefits to the small producer, especially in low-income countries, and focusing on growing vegetables with a natural fertilizer. Still has one, as mentioned by Valentine et al. (2018), that cuniculture has several advantages for creation, because it is an activity that requires little space, relatively simple management, with little physical effort, low initial investment cost, high prolificity, besides being a very interesting activity from the point of view of environmental sustainability, due to the low production of waste, but of good quality, the high degree of utilization of by-products and low water consumption.

Organic, plant, or animal residues generated by agricultural activities are important sources of biomass (ORRICO et al.,2007)which can be reintegrated into the production chain by incorporation into the soil, adding economic and environmental values to production, due to lower expenditure of industrial supplies (LOSS et al., 2009), because it favors soil fertility by releasing nutrients during the crop cycle (SEDIYAMA et al., 2009).

The manures of some animals, such as cattle, poultry, pigs, goats, and rabbits are sources of organic matter, favor the improvement of chemical, physical and biological attributes of the soil and can be a source of nutrients (MORAL et al., 2005), both if used separately (NICOLAU SOBRINHO et al., 2009) and as one of the raw materials used in the

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composition of substrates with industrial fertilizers (SILVA et al., 2011) or even with other plant sources (SERRANO et al., 2011).

The rabbit compost used as the fertilizer of plants is of high quality, due to its unique composition rich in nitrogen and also contains a large amount of phosphorus, important for the growth of flowers and fruits. This residue has a dark brown color, a homogeneous texture, humidity in the order of 40%, and an intense ammoniacal odor, from urine (FERREIRA, 2017).

Thus, the objective of this work was to generate information about cunicultural production in the Agroecology Center of the Itamarati Settlement, with emphasis on the use of rabbit manure as a source of plant fertilization in an agroecological system.

METHODOLOGY

For the beginning of the extension project, contact with the farmers, and exposure of the project, identification of multiplier agents was made. The activities described here are inserted in the interstitium from January to April 2020, being developed in two stages. The first stage refers to theoretical explanation focusing on the use of feces as fertilizer and the second, is the creation itself of animals.

Thus, as a rural extension activity, since 2019, the Research and Extension Group in Cuniculture of UFGD develops rabbit breeding as a strategy of diversification in the activities of small producers in the Itamarati, Ponta Porã, MS. These communities develop horticulture based on organic production techniques, where there are leftover vegetables that have been used as part of animal feed.

The animals were from the Experimental Farm of Agricultural Sciences (FAECA) of the Federal University of Grande Dourados (UFGD), located in the municipality of Dourados - MS (Figure 1).

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Figure 1. Breeding rabbits housed in the Cuniculture sector of UFGD

Therefore, on the one hand, there is a breeding of rabbits housed in the Experimental Farm of Agrarian Sciences that guarantees support in obtaining the animals to be given, and on the other side, there is a public that will receive the extensionist action that has a significant amount of waste from organic horticulture to complement the feeding of rabbits.

The actions started previously with the formation of a group (total of 06 families) and recently 05 mestised matrices of the California breed were distributed, aged 5 months, all able to be mated. These were placed in simple wooden installations with fabric, suspended,

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having a container to place the concentrate, water, and place to place the foliage that, in this case, were the vegetables grown organically by the participants themselves.

The visits took place once a month, through meetings attended by professors and students of UFGD, technician of the Association of Organic Producers of Mato Grosso do Sul (APOMS), and the group members (collectively), who were oriented with a practical focus, based on revisions of the theory, when the first stage was explained, rabbit manure as complementation of fertilization.

The contents emphasized in the second stage involved: other breeds used for meat production, production systems considering facilities, reproductive management, food management, and zootechnical control, so that at the end of the actions, those involved can continue the creation. As a way of evaluating the actions proposed and executed, a questionnaire was created, where participants answered questions about the use of rabbit feces, themes presented, the performance of teachers and students, general organization, and expectations.

Data analysis was performed with the aid of spreadsheets, and Microsoft Office Excel was used® (2007). The data from the collections were tabulated and transformed into percentage values, based on these, constructed figure to facilitate the interpretation of the results obtained.

RESULTS AND DISCUSSION

One of the approaches of the extension work, involving the rearing of rabbits in small rural properties, is the correct and adequate use of products from the breeding of these animals, which in this case refers to the use of feces. It can be highlighted the organic fertilizer has a great economic value and can be sectioned in composting or humus (derived from the creation of earthworms). Assuming that for the cultivation of organic vegetable garden in which the fertilization structure is originally based on rabbit feces, it becomes clear the sustainability of a system, involving, creation-by-product-environment.

Collaborating with this idea, Ferreira et al. (2013) found that the composting practice is still very present in rural areas for organic fertilization of vegetable gardens and

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small crops. In Figure 2, it is possible to verify the increase and maintenance of plant production in an organic production system of the Agroecology Center of the Itamarati Settlement for 8 weeks using manure from rabbit production as fertilizer.

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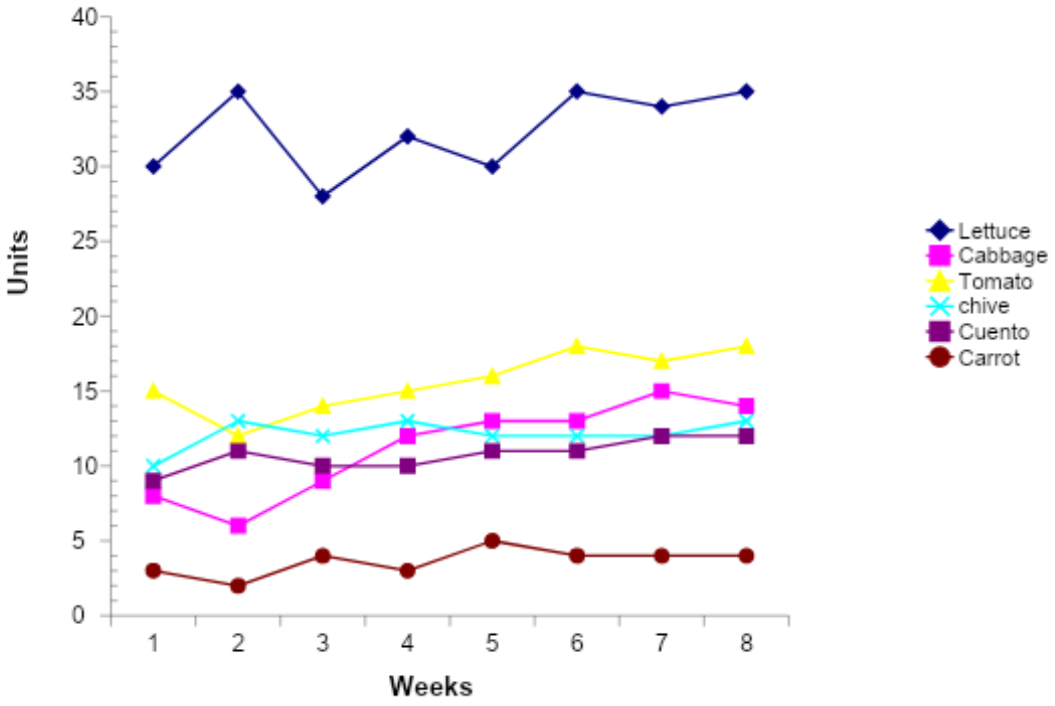
Figure 2. Production of vegetables in the agroecological system using as fertilizer the manure from the production of rabbits.



This maintenance of production is due to the awareness of farmers due to the information passed by project participants, professors and students of UFGD, technicians of APOMS, and the commitment of producers to propagate past learning and follow the productive recommendations in each crop. Producers worry about not using agrochemicals in crops that will go to their food, their families, and friends, by the high prices of supplies for small-scale application and the responsibility to dispose of organic waste in appropriate environments.

The excellent production of vegetables, vegetables, and legumes in the assisted settlement is due, in addition to the correct agronomic management, also to the nutritional characteristics of cunícola manure. Barbieri et al. (2014) used rabbit feces in their experiment because they had a rounded and firm shape, not soiling the ground at their contact, thus facilitating their management. Its main characteristic is that, in addition to contributing by eating vegetable residues and producing organic matter for the compost, a rabbit is ready for

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slaughter around 90 days of age, producing meat that can be consumed or sold and also selling puppies, ensuring income generation.

Thus, it can be inferred that this association of garden surpluses with the rearing of herbivore animals, such as rabbits, has shown to be a promising activity, where these residues can supply part of the rabbit's diet and thus have a productive activity that provides income generation and protein source, allowing improvement in the condition of families and, especially, autonomy of the group, as observed by Gabriel et al. (2019).

The university extension being worked on in this production approach brings generous economic, socio-environmental, and sustainable benefits to the small rural producer, especially in situations where they have low income. These actions have the participation of scholarship students and professors of UFGD allied to the integration to the Center for participatory construction of knowledge in agroecology and organic production of UFGD and the Technological Vocational Center in Agroecology and Organic Production, in Mato Grosso do Sul.

Oliveira et al. (2017) concluded that it is essential to organize producers and that it is assisted by technicians, public institutions in a priority and permanent manner, because the development of family farming certainly goes against the interests of agribusiness sectors committed to the agro-industrial complex of conventional agriculture, however, it will allow the sustainable success of its activity due to the quality of life and especially its permanence in the field.

To Menegatet al. (2019), the exchanges of knowledge provide the settlers with new perspectives on the possibilities of production and with this a new arrangement has been possible, based on the diversification of products, taking advantage of the potential of the place, adopting techniques of cultivation and production. These are ingredients of university extension in rural communities. In short, the settlement breathes new airs of hope and knowledge, promoting changes, possible through dialogue with the university given the positive responses in the evaluations related to the themes presented about rabbits, the performance of teachers and students, general organization, and expectations.

CONCLUSIONS

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It can be observed that cuniculture gains extreme social and environmental importance, as it can contribute to improvement in the feeding of the population by offering a protein source of high nutritional quality and through composting of organic remains produced by the creation that organically enables the production of vegetables. The manure from rabbit production proved to be highly efficient for plant production in an agroecological system, ensuring greater sustainability in the animal and vegetable production cycle.

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REFERENCES

BARBIERI, M.; FLORENTINO, L. A.; BARBIERI, M. D. P. Cultivo de hortaliças em pequenas áreas urbanas. In:Congresso Nacional de Meio Ambiente, 11, 2014. Poços de Calda. **Anais**..., Poços de Calda, maio 2014.

CARVALHO, M. M. X.de; NODARI, E. S.; NODARI, R O. "Defensivos" ou "agrotóxicos"? História do uso e da percepção dos agrotóxicos no estado de Santa Catarina, Brasil, 1950-2002. **História, Ciências, Saúde-Manguinhos**, v. 24, n. 1, p. 75-91, 2017.

FEREIRA, R. D. S. Eficácia de um composto de resíduos de cunicultura com palha na produtividade e qualidade da alface. 2017, 82f. **Dissertação** (Mestrado em Agricultura Biológica) - Instituto Politécnico de Viana do Castelo, Portugal, 2017.

FERREIRA, A.G.; BORBA, S. N. S.; WIZNIEWSKY, J. G. A prática da compostagem para a adubação orgânica pelos agricultores familiares de Santa Rosa/RS. **Revista Eletrônica do Curso de Direito da UFSM**. UFSM,v.8, 2013.

GABRIEL, A.M.A.; OLIVEIRA, E. R; GOUVEA, W. S.; MUNIZ, E. B.; GANDRA, E.R.S.; GANDRA, J. R.; CARMO, A. A.; PEREIRA, T.L.; PORDEUS, N. M.; SANTOS, G.R.O. Utilização de forragens oriunda da horta orgânica na criação de coelhos. **Realização**. UFGD, v. 6, n.11, p. 5-13, 2019.

LOSS, A.; PEREIRA, M. G.; SCHULTZ, N. FERREIRA, E. P.; SILVA, E. M. R.; BEUTLERET, S. J. Distribuição dos agregados e carbono orgânico influenciados por manejos agroecológicos. **Acta ScientiarumAgronomy**. Maringá, v. 31, n. 3, p. 523-528, 2009.

MENEGAT, A.S.; NUNES, F. P.; CONCEIÇÃO, C. A.; OLIVEIRA, E. R.A Extensão Universitária no Assentamento Areias, Nioaque/MS: diálogos transformando pessoas, saberes e processos de produção.**Realização**. UFGD, v.6, n.12, p.16-35,2019.

MORAL, R.; MORENO-CASELLES, J.; MURCIA, P.; PEREZ-ESPINOSA, A.; RUFETE, B.; PAREDES, C. Characterization of the organic matter pool in manures.**Bioresource Technology**, Nova Iorque, v. 96, n. 2, p. 153-158, janeiro, 2005.

NEVES, V. C.; KOMORI, O. M. Perseverança agroecológica: uma experiência em evolução no Assentamento Itamarati, em Ponta Porã, MS. **Cadernos de Agroecologia**, v. 5, n. 1, 2011.

NICOLAU SOBRINHO, W.;SANTOS, R.V.; MENEZES JR., J. C.; SOUTO, J. Acúmulo de nutrientes nas plantas de milheto em função da adubação orgânica e mineral. **Revista Caatinga**, Mossoró, v. 22, n. 3, p. 107-110, 2009.

OLIVEIRA, E. C.; SOUZA, J. R.P.; FONSECA, E. P.; DIAS, F. M. V.; OLIVEIRA, D. L. PROJETO CAMPO FÁCIL - UEL: Assistência técnica e difusão de tecnologia aos agricultores familiares do Município de Londrina – PR. **Extensão Rural**, DEAER – CCR – UFSM, Santa Maria, v.24, n.1, jan./mar. 2017.

ORRICO, A. C. A.; LUCAS JR., J.; ORRICO JR. M. A. P. Caracterização e biodigestão anaeróbia de caprinos. **EngenhariaAgrícola**, Jaboticabal, v. 27, n. 3, p. 639-647, set.-dez., 2007.

SCHEMBERGUE, A.; CUNHA, D. A.; CARLOS, S. M.; PIRES, M. V.; FARIA, R. M. Sistemas agroflorestais como estratégia de adaptação aos desafios das mudanças climáticas no Brasil. **Revista de Economia e Sociologia Rural**, v. 55, n. 1, p. 9-30, 2017.

SEDIYAMA, M. A. N.; VIDIGAL, S. M.; SANTOS, M. R.; SALGADO, L.T. Rendimento de pimentão em função da adubação orgânica e mineral. **Horticultura Brasileira**, Vitória da Conquista, v. 27, p. 294-299, set., 2009.

SERRANO, L. A. L.; SILVA, V. M.; FORMENTINE, E. A.Uso de compostos orgânicos no plantio do cafeeiro conilon. **Revista Ceres**, Viçosa, v. 58, n.1, p. 100-107, jan.-fev., 2011.

SILVA, T. R. S.; MENEZES, J. F. S.; SIMON, G. A.; ASSIS, R. L.; SANTOS, C. C. J. L.; GOMES, G. V. Cultivo de milho e disponibilidade de P sob adubação com cama-de-frango.

Revista Brasileira de Engenharia Agrícola e Ambiental, Campina Grande, v. 15, n. 9, p. 903-910, set., 2011.

VALENTIM, J. K.; MACHADO, L. C.; LOPES, V. L.; PAULA, K. L. C.; BITTENCOURT, T. M.; RODRIGUES, R. F. M.; ROBERTO, C. H. V.; DALLADO, G. M. Perfil dos criadores de coelho PET no Brasil. **Revista Brasileira de Cunicultura**, v. 13, p. 27-45, 2018. Disponível em: http://www.rbc.acbc.org.br/index.php?option=com_content&view=article&id=75&Itemid=96 Acesso em fevereiro de 2020.

ZACHOW, M.; SCHWANKE, J.; MONTEIRO, J.; FEIDEN, A. PAVEI, D. A agroecologia como fonte de renda e qualidade de vida: o caso de uma propriedade em Quatro Pontes/PR. **Gestão e Desenvolvimento em Revista**, v. 4, n. 2, p. 4-18, 2018.