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GROWTH AND PRODUCTIVITY OF ÁGATA POTATO CULTIVAR UNDER DIFFERENT DOSES OF ORGANOMINERAL FERTILIZER

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Abstract
Potato is a plant that has high nutrient demand during its cycle. Given the concern with the environment, due to the large amount of synthetic mineral fertilizer used in the crops, the objective of this work was to evaluate the efficiency of organomineral fertilizers in the cultivation of potato, cultivar Ágata, under cerrado conditions. The experimental design was in subdivided plots, consisted of four doses of organomineral fertilizer, corresponding to 40, 60, 80, 100 and 120% of the mineral fertilizer dose in the organomineral source (2800 kg ha^{-1} of formulated 3-32-6) and the subplots consisted of four collection seasons (61, 74, 89 and 110 days after planting) and four repetitions. Organomineral fertilizer with 40% of the recommended dose for potato cultivation provides higher yield of tubers in the Especial potato class and higher accumulation of total dry mass, in addition to providing satisfactory productivity for the tubers of higher commercial value. The use of organomineral fertilizers promotes the same behavior as mineral fertilizers, not interfering with potato development.

Keywords: Mineral. Nutrient Cycling. Organic. *Solanum tuberosum* L.

1. Introduction

Potato (*Solanum tuberosum* L.) stands out as a food of major importance worldwide, being grown in more than a hundred countries and consumed practically global for being a crop of excellent nutritional composition, gastronomic versatility, technological adaptations, and low price. Its productive efficiency ensures greater use of areas intended for food production, a characteristic that shows the trend of crop growth in a world scenario of constant population growth.

Potato is a relatively short cycle vegetable, ranging from three to four months, with high yields per area. As a result, it is demanding on the presence of nutrients available in the soil solution, justifying high doses of inorganic fertilizers, reflecting on the production costs and the risks of environmental contamination (Feltran et al. 2012). The relative demand for potato crop fertilizer is the largest among the crops grown in the country, ranging from 2.3 to 2.8 t ha^{-1} (Queiroz et al. 2013). Organomineral fertilizer, when applied at the optimal dose, can promptly meet the nutritional requirement of the crop. In potato crop the maximum absorption for N, K, Mg and S occurs between 40 and 50 days after plant emergence, whereas for P and Ca, absorption occurs throughout the growing season, up to 80 days after planting (Tavares et al. 2002).

Due to environmental awareness and changes in legislation in recent years, coupled with the scarcity of raw materials to produce mineral fertilizers and the high costs for their production, the use of urban, industrial and agricultural waste in fertilizer formulation has been intensified in order to clean up the environment and create alternative products for use in agriculture. Cardoso et al. (2015) reported higher productivity and better quality of tubers due to the use of organomineral fertilizers at the same levels of compost with mineral fertilizers. These fertilizers have been improved for use in different crops such as onion (Higashikawa and Menezes Júnior 2017), soy (Domingos et al. 2018), sesame (Souza et al. 2018), sweet potato (Polastreli et al. 2018) and many other species, including cereals of great economic importance.

The immediate availability of certain nutrients is the main feature of the mineral fraction of organomineral fertilizers. The presence of organic matter in the composition can add several advantages, including the complexation by humic substances of metals such as iron, aluminum, and manganese. These substances are produced by microorganisms and act on micronutrient complexation, preventing them from becoming unavailable to plants (Leite and Galvão 2008).

Countless formulations can be produced from the combination of different raw materials of organic and mineral origin. Determine how nutrient release occurs from organomineral fertilizers so that the correct doses for the crop can be estimated; and associate nutrient release with nutrient absorption and exportation for potato cultivars have become key issues for the development of high efficiency fertilizers.

Thus, the objective of this work was to evaluate the growth and response to organomineral fertilizer, as well as the reduction in doses compared to conventional fertilizer in potato crop.

2. Material and Methods

The experiment was carried out at the Wehrmann Agricultural Experimental Farm, in Cristalina - GO, at an altitude of 987 m at the following geographic coordinates: latitude 16º10'49.80''S and longitude 47º27'55.27'W. The climate of the region is classified by the Köppen method as Aw, representative of the cerrado region, tropical hot and humid with cold and dry winter (Rolim et al. 2007). The average annual rainfall is 1426.3 mm and the average annual temperature is 21.5°C.

The soil of the cultivated area was classified as Dystrophic Red Latosol (DRL) with clay texture (Santos et al. 2013). Prior to the installation of the experiment, soil sample collection and chemical analysis were performed (Table 1).

Table 1. Chemical characterization of soil in the experimental area.

Prof.	pH	P	K	Ca	Mg	Al	MO	SB	T	V	m
Cm	H_2O	---mg dm^{-3}---		----$cmol_c$ dm^{-3}-----			--g dm^{-3}-	$cmol_c$ dm^{-3}-		---%---	
0 – 20	6.4	50.0	161.0	5.4	1.0	0.0	8.29	3.6	8.8	77	0.03

P = Method Mehlich1, P, K, Na = [HCl 0.05 mol L^{-1} + H_2SO_4 0.0125 mol L^{-1}], S-SO_4 = Monobácico Calcium Phosphate [0.01 mol L^{-1}], Ca, Mg, Al = [KCL 1 mol L^{-1}] / H + Al = [SMP buffer solution at pH 7.5], MO = Colorimetric Method, SB= Sum of base, V = Base saturation; T = CEC at pH 7.0 (Donagema et al. 2011).

The planting was carried out in an area with central pivot irrigation system and conducted from May to August, characterizing winter crop, with the cultivar Ágata.

The experimental design was randomized blocks with four replications and six treatments: mineral fertilizer and organomineral fertilizer in the doses of 40%, 60%, 80%, 100% and 120%, based on the fertilizer recommendation for the crop (Sousa and Lobato 2004) (Table 2).

Table 2. Description of the treatments evaluated.

Treatments[1]	Source of fertilizer	Percentage in relation to the recommendation (%)	Dose applied ($kg\ ha^{-1}$)
Mineral fertilizer	Mineral fertilizer	100	2800.00
Organomineral 40	Organomineral	40	1629.10
Organomineral 60	Organomineral	60	2443.60
Organomineral 80	Organomineral	80	3258.20
Organomineral 100	Organomineral	100	4072.70
Organomineral 120	Organomineral	120	4887.30

[1]Two formulations were used 3-32-06, being one in the form of minerals and other organomineral.

The soil preparation of the experimental area was carried out according to the recommended for potato cultivation, with a plowing followed by leveling harrow and subsequent opening of the furrows at a depth of 15 cm (Filgueira 2008). Fertilization was performed manually and incorporated with the use of hoes. 30 $kg\ ha^{-1}$ of a macro and micronutrient source composed of 2.7% Ca, 8.2% S, 12% Zn and 6% B, were applied to the planting furrow in all plots, according to Sousa and Lobato (2004) recommendation for potato cultivation.

The experimental plot of 48 m² (4.8 x 10 m) was composed of 6 lines, spaced 0.8 m between lines and 10 m long. The evaluations were carried out in the two central lines that comprised the useful area of the plot, disregarding two lines on each side of the blocks and half meter initial and final of each block, totalizing 14.4 m² of usable area. The seed tubers used from the cultivar Ágata belonged to type III class (30 to 40 millimeters in diameter), being swon 526 seed tubers per plot.

The mineral fertilizer used in the experiment was formulated 3-32-06, composed of the mixture of urea granules, triple superphosphate and potassium chloride. The organomineral fertilizer used in the experiment was produced by the company Geocycle Biotechnology based in Uberlândia-MG, using poultry litter from local farms. Initially the poultry litter was composted and after stabilization were added mineral sources aiming the nutrient balance. Subsequently, the material was homogenized and pelleted. The pellets produced had hardness equivalent to 8 $kgf\ cm^{-2}$ with high breaking resistance, aiming to reduce the formation of uneven particles. The chemical characteristics of the mineral and organomineral fertilizer used in the experiment are presented in Table 3.

Table 3. Macro and micronutrients in mineral and organomineral fertilizer.

	Mineral source	Organomineral source
	$dag\ kg^{-1}$	
Nitrogen (N)	3.00	2.00
Phosphorous (P)	32.00	22.00
Potassium (K)	6.00	4.00
Calcium (Ca)	2.00	1.40
Sulphur (S)	2.00	1.40
Magnesium (Mg)	1.50	1.10
Boron (B)	0.20	0.14
Copper (Cu)	0.10	0.07
Manganese (Mn)	0.15	0.11
Zinc (Zn)	0.14	0.14

In order to stimulate tuberization, heap was done 30 days after planting in all plots e 300 $kg\ ha^{-1}$ of the formulated 20-00-20 was applied in the top dressing. The crop received 500 mm of water via irrigation system during the cycle.

Plant collections for growth analysis were performed at 35, 61, 74, 89 and 110 days after planting. To measure potato development, three plants were harvested per plot in each collection, totaling five collections throughout the cycle. In the laboratory, the plants were sectioned into leaves, stems and tubers, evaluating the following characteristics: length of the largest stem (the insertion point of the stem in the tuber/seed until the apical tuff was considered) using a millimeter tape; number of stems (NS) and tubers (NT); and the determination of fresh mass (FM) of leaves, stems and tubers obtained by weighing in analytical balance.

After the analyzes, the plant samples were placed in paper bags and submitted to oven drying with forced air circulation at 65°C until reaching a constant mass (about 96 hours). After this period the tubers were sectioned transversely to facilitate drying. The samples were reweighed after drying, obtaining the dry mass (DM) in kg.

To determine productivity, the tubers of the two central lines were harvested 90 days after planting, disregarding the two lines on each side of the blocks and the first initial meter and the last final meter of each block, having a plot area of 6.4m^2. After harvesting, the tubers were weighed and classified, estimating the productivity and the yield of the classes in t ha^{-1}.

The classification was made according to the diameter of the tubers and in the Especial (42-70mm), Primeira (33-42mm), Segunda (28-33mm), Diversa (up to 28mm), Boneca (tubers with some physiological disorder) and Descarte (damaged, non-commercial tubers) classes.

The data obtained were submitted to analysis of variance, by the F test, at 0.05 significance level. The averages obtained for the doses were submitted to the Tukey test and the seasons to the polynomial regression with the aid of the SISVAR program (Ferreira 2014). Multivariate methods were also employed using the principal component analysis technique (PCA) via the correlation matrix through the SPSS application, performed in the SPSS software (version 18.0) (International Business Machines (IBM) Corporation, Nova York, EUA) (Pan et al., 2013).

3. Results and Discussion

Organomineral fertilizer 100 promoted the smallest dry mass accumulation of stems (DMS). Organomineral fertilizer 60 and organomineral fertilizer 80 promoted higher leaf dry mass accumulations (DML) when compared to other treatments (Table 4). The increase in productivity of cultivar Ágata is related to the greater number of leaves (Fernandes et al. 2010) due to the higher number of chloroplasts and consequently the increased light uptake by the leaves, thus promoting an elevation in the photosynthetic process, mainly responsible for the energy production of plants.

Table 4. Attributes of growth of potato cultivar Agata.

Treatments	NS	NT	LS	DMS	DML	DMT	DMTot
		cm			kg ha^{-1}		
Mineral fertilizer	12.93^A	3.12^A	44.96^A	907.65^A	700.21^B	2156.48^A	3764.35^A
Organomineral 40	14.50^A	2.94^A	41.04^A	983.02^A	738.78^B	1897.57^A	3619.37^A
Organomineral 60	14.68^A	3.12^A	42.94^A	987.14^A	888.98^A	1750.18^A	3626.30^A
Organomineral 80	12.87^A	3.37^A	36.60^A	987.97^A	959.58^A	1397.24^B	3344.79^B
Organomineral 100	14.43^A	3.50^A	40.54^A	840.76^B	729.99^B	1413.33^B	3047.08^C
Organomineral 120	14.43^A	3.50^A	37.76^A	985.55^A	699.30^B	1405.28^B	3090.13^C

Averages followed by different letters in column differ by Tukey test at 0.05. NS: number of stems; NT: number of tubers; LS: length of the highest steam; DMS: dry mass of stems; DML: dry mass of leaves; DMT: dry weight of tubers; DMTot: total dry mass.

The dry mass of tubers (DMT) and total dry mass (TDM) was higher for treatments with organomineral fertilizer 40, organomineral fertilizer 60 and mineral fertilizer. Organomineral fertilizer 100 and organomineral fertilizer 120 treatments presented lower DML, DMT e TDM. The variables number of stems (NS), number of tubers (NT) and length of the highest steam (LS) did not differ between treatments (Table 4).

The maximum NS, 10.2, was observed at 78 DAP (Figure 1A). It is important to evaluate this variable, as each stem represents an independent plant and they compete for light, nutrients and water, interfering in the number and size of the tubers (Queiroz et al. 2013).

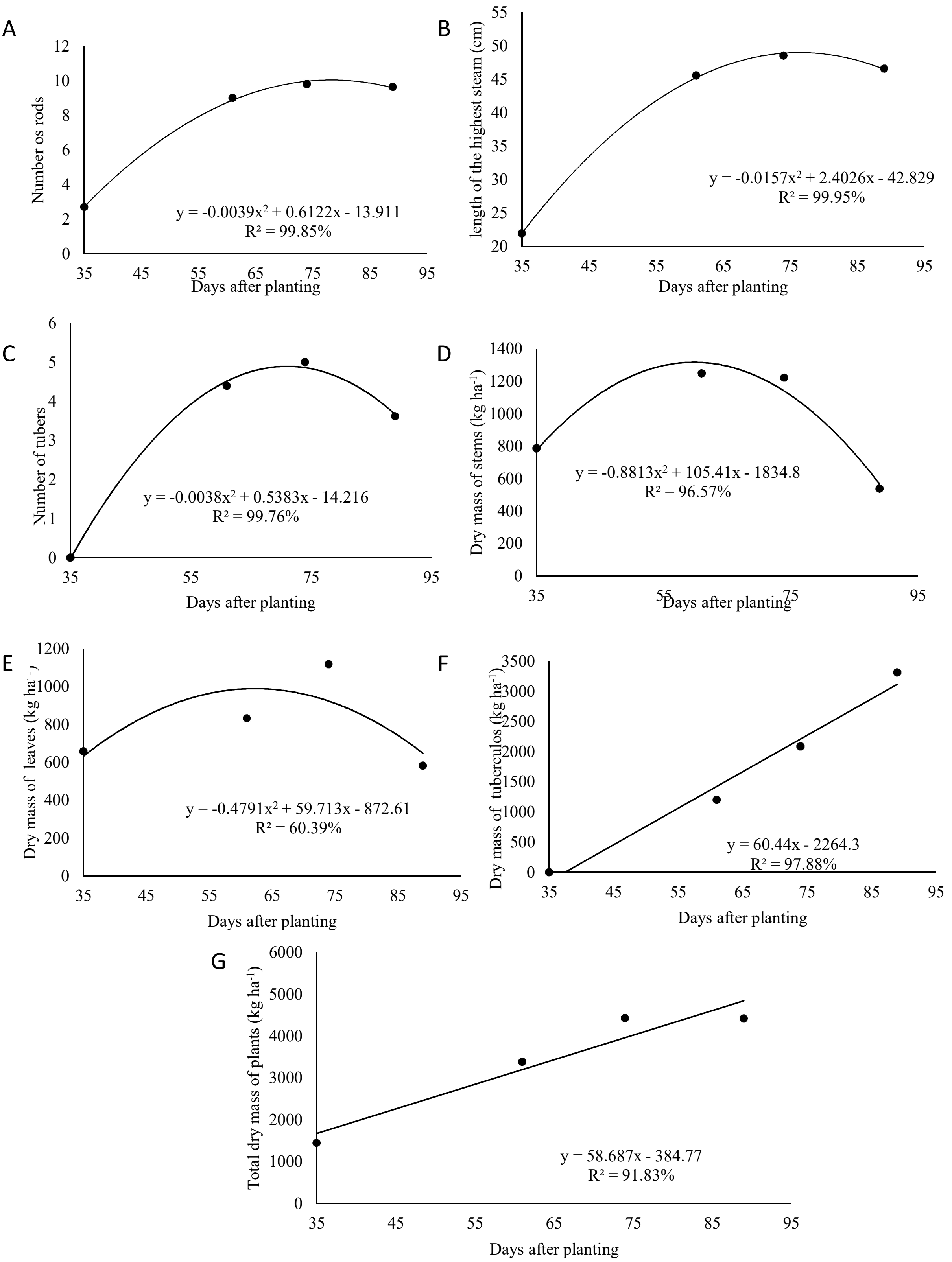

Figure 1. A – number of rods; B – length of the highest steam (cm); C – the number of tubers; D – dry mass of stems; E – dry mass of leaves; F – dry mass of tubers; and G – total dry mass of plants in relation to the days after planting.

The maximum LS of 49 cm was observed at 76 DAP (Figure 1B). The cultivar Ágata is characterized by Nivaa (2002) as a small cultivar, being that, including the portion located below the heap line, the length of the largest stem is less than 60 cm. According to Lopes et al. (2013), the Ágata potato had continuous growth of the stem until 78 DAP, stabilizing later, with the average of the largest stem being 50 cm. Bregagnoli and Minami (2005), studying the potato culture, observed in the cultivars Atlantic, Asterix and Lady Rosetta, a height of 45.2 cm in the plants at 45 DAP, when supplied 1000 kg ha^{-1} of the fertilizer 4-14-

08. Queiroz et al. (2013), working with NPK mineral fertilizer in potato cultivar Ágata, did not observe an increase in LS in the three evaluation periods: 24, 41 and 57 DAP.

The maximum number of tubers, 4.8, was verified at 71 DAP (Figure 1C), after that period there was a decrease in that. This can be explained due to the beginning of the tuber filling stage, at that stage becomes dominant as the drain of photoassimilates in relation to the initiation of new tubers. In accordance with Fernandes et al. (2010), for the same cultivar and planting time, found a maximum of 14 tubers per plant at 97 DAP. This is because the potato plants developed at an average temperature of 18°C in the municipality of Botucatu-SP and in this study the plants developed in a region with an average of 20.4^{o}C.

The precocity of plants in the production of tubers is influenced by the higher temperature conditions in the cerrado region. Plants subjected to higher temperatures absorb a greater amount of light energy in a short period of time, culminating in a synchrony between the tuberization period and the maximum photosynthetic development of the leaves. Thus, in addition to factors related to the quality of seed tubers used in planting, attention must be paid to the conditions of soil moisture, light intensity, photoperiod, nutrients and plant health (Boiteau et al. 2010).

The accumulation of 1316,8 kg ha^{-1} of DMS occurred at 60 DAP (Figure 1D). After this period, a decrease in DMS was found due to the photoassimilates produced by the plant being used in the production and filling of tubers. In accordance with Fernandes et al. (2010). The use of mineral fertilizer provided the following values for Asterix, Atlantic, Markies and Ágata cultivars up to 76 DAP: 358.8, 230.9, 210.1 and 199,1 kg ha^{-1} with a third of the plant population in relation to this work.

At 62 DAP the maximum accumulation of DML was 988 kg ha^{-1} (Figure 1E). The tuberization phase is when the plant reaches its maximum foliage, from this stage on, most photoassimilates are concentrated for the production and filling of tubers. Fernandes et al. (2010) observed an accumulation of 692.7 kg ha^{-1} for DML between 76 and 80 DAP in the potato cultivar Ágata.

The organic matter present in the organic source used in the production of organomineral fertilizer has the capacity to retain positive charges in tropical and subtropical soils, provides nutrients gradually, processes elements harmful to plant development, improves aeration, infiltration and water retention, providing carbon and releasing energy for heterotrophic microorganisms, thus being a pioneer in improving the production capacity of these types of soils (Bayer and Mielniczuk 2008).

The experiment carried out by Teixeira et al. (2011) in the cultivation of corn in tropical soils found an increase of 20% in the dry mass of plants in the use of organomineral fertilizer when compared with mineral fertilizer. The solubilization of the organomineral fertilizer occurs gradually during the development of the crop, allowing the coincidence to happen between the release and the periods of greatest nutritional demand by the plants (Kiehl 2008).

DMT accumulated during the culture cycle, in which the maximum observed was 3294.6 kg ha^{-1} at 110 DAP (Figure 1F). Fernandes et al. (2010) observed maximum accumulations of 5268.0 kg ha^{-1} for the cultivar Ágata at 97 DAP. Among the cultivars evaluated by the authors, the cultivar Ágata showed the lowest accumulation of DMT. It is worth mentioning that the cultivar Ágata is the most used in commercial plantations in Brazil (Bezerra et al. 2007) and the use of formulated fertilizer in potato cultivation promotes positive responses, mainly for N, P, K. (Cardoso et al. 2007).

Regarding the total dry mass of the plants throughout the crop cycle, the maximum accumulation at the end of the cycle was 4413 kg ha^{-1} at 110 DAP (Figure 1G). These results differ from those found by Fernandes et al. (2010), which verified the total dry mass of plant to be 5268 kg ha^{-1}.

The potato first forms the aerial part and later the tuberization, being that the largest dry mass occurred at 61 days on the stems. The leaves accumulated up to 74 days, being mainly responsible to produce photoassimilates that was used as a drain for the production and formation for the tubers, which presented a higher concentration of dry mass at 89 days (Table 5). This accumulation was noticed both in the use of organomineral fertilizer and in conventional mineral fertilizer. When analyzing the development of the potato in the present work it was possible to verify that the accumulation of dry mass in the potato plants occurs until the end of the cycle (Tekalign and Hammes 2005).

Table 5. Attributes of growth of the potato cultivar Agata to 35, 61, 74 and 89 days after planting.

Period	Treatments	NS	NT	LS	DMS	DML	DMT	DMTot
35	Mineral fertilizer	2.2A	20.1A	0.0A	637.5A	475.0A	0.0A	1112.5A
	Organomineral 40	2.9A	23.7A	0.0A	594.9A	698.7A	0.0A	1293.6A
	Organomineral 60	2.9A	25.2A	0.0A	863.6A	799.9A	0.0A	1663.5A
	Organomineral 80	2.2A	21.7A	0.0A	931.3A	745.6A	0.0A	1676.1A
	Organomineral 100	3.0A	23.0A	0.0A	689.2A	630.8A	0.0A	1320.0A
	Organomineral 120	3.0A	18.0A	0.0A	1001.7A	594.3A	0.0A	1596.1A
61	Mineral fertilizer	9.2A	47.7A	4.7A	1399.7A	792.5A	1066.4A	3857.6A
	Organomineral 40	8.5A	46.5A	3.7A	1327.5A	884.4A	1258.1A	3470.0A
	Organomineral 60	8.7A	52.0A	4.5A	1166.2A	850.7A	1302.2A	3319.2A
	Organomineral 80	9.5A	38.7A	4.5A	1244.2A	800.1A	1075.2A	3119.5A
	Organomineral 100	9.2A	45.7A	4.5A	1111.1A	780.5A	1183.2A	3074.7A
	Organomineral 120	9.0A	42.5A	4.5A	1242.7A	877.7A	1329.0A	3448.7A
74	Mineral fertilizer	9.7A	53.0A	5.0A	1144.2A	943.8A	2914.7A	5002.5A
	Organomineral 40	9.7A	48.9A	5.0A	1134.7A	957.4A	2506.5A	4598.4A
	Organomineral 60	10.5A	47.0A	5.0A	1263.8A	1383.0A	1918.2A	4565.0A
	Organomineral 80	9.7A	48.0A	5.0A	1434.7A	1331.5A	1799.1A	4565.0A
	Organomineral 100	9.5A	46.0A	5.0A	1241.0A	1013.1A	1595.3A	3849.5A
	Organomineral 120	9.7A	48.1A	5.0A	1116.0A	1071.0A	1767.0A	3954.0A
89	Mineral fertilizer	10.0A	59.0A	2.7A	449.3A	589.6A	4045.9A	5084.7A
	Organomineral 40	10.2A	45.0A	3.0A	875.0A	414.6A	3925.8A	5115.4A
	Organomineral 60	10.0A	47.5A	3.0A	654.9A	522.3A	3780.3A	4957.5A
	Organomineral 80	9.7A	38.0A	4.0A	341.6A	961.1A	2714.6A	4017.4A
	Organomineral 100	9.0A	47.5A	4.5A	320.9A	747.5A	2874.8A	3943.1A
	Organomineral 120	9.0A	42.5A	4.5A	582.4A	254.1A	2525.1A	3361.7A

Averages followed by different letters in column differ by Tukey test at 0.05. NS: number of stems; NT: number of tubers; LS: length of the highest steam; DMS: dry mass of stems; DML: dry mass of leaves; DMT: dry weight of tubers; DMTot: total dry mass.

The NS did not show a positive correlation with any of the correlated characters, that is, when increasing the NS, the other characteristics reduce (Table 6). LS presented a moderate correlation with NT (0.535) and a high correlation with DML and DMT, with values equal to 0.763 and 0.806, respectively.

Table 6. Correlation Matrix for attributes of growth of the potato cultivar Agata.

	NS	LS	NT	DMS	DML	DMT	DMTot
NS	1	-0.625**	-0.745**	-0.402	-0.653**	-0.646**	-0.791**
LS	-0.625**	1	0.535**	0.154	0.399	0.763**	0.806**
NT	-0.745**	0.535**	1	0.704**	0.712**	0.531**	0.764**
DMS	-0.402	0.154	0.704**	1	0.642**	-0.160	0.178
DML	-0.653**	0.399	0.712**	0.642**	1	0.299	0.572**
DMT	-0.646**	0.763**	0.531**	-0.160	0.299	1	0.938**
DMTot	-0.791**	0.806**	0.764**	0.178	0.572**	0.939**	1

**Significant at 0.05 by F. NS: number of stems; NT: number of tubers; LS: length of the highest steam; DMS: dry mass of stems; DML: dry mass of leaves; DMT: dry weight of tubers and DMTot: total dry mass.

NT correlated negatively with NS and correlated positively with DMS, DMSTot, DMT and DML. DMT showed a strong correlation with DML (0.939), as the DML increased, there was an increase in DMT. For several authors, the greater the number of leaves per plant, the greater the leaf area and, consequently, the greater the productivity of the plant, since with the increase in the photosynthetic area there is an increase in the production of glucose, the main source of energy for plants.

The Especial class, which has the characteristics that are sought after by potato growers due to its diameter greater than 45 mm, showed no differences between the treatments analyzed. The potato of the Segunda class had lower productivity in treatments with organomineral fertilizer, 60 and 120%.

Potato productivity was satisfactory considering the Brazilian average of 28.8 tons ha^{-1} (Table 7). Total productivity is the sum of the yield of all classes of tubers, commercial productivity is the sum of the Especial, Segunda and Diversa classes, which will go to the market. The Boneca class is a classification of tubers with physiological disorders without commercial value.

Table 7. Productivity and classification of tubers (t ha^{-1}) for cultivating potatoes Agate depending on the use of high doses of mineral fertilizer and organomineral.

Treatments	Productivity (t ha^{-1})						
	Total	Classification					
		Comercial	Especial	Segunda	Diversa	Boneca	Descarte
Mineral Fertilizer	43.12^{A}	41.43^{A}	37.41^{A}	3.30^{A}	0.71^{A}	0.94^{A}	0.75^{A}
Organomineral 40	41.51^{A}	39.70^{A}	35.62^{A}	3.61^{A}	0.45^{A}	0.98^{A}	0.84^{A}
Organomineral 60	42.50^{A}	38.97^{A}	35.58^{A}	2.85^{B}	0.54^{A}	2.67^{B}	0.85^{A}
Organomineral 80	42.94^{A}	41.02^{A}	36.91^{A}	3.52^{A}	0.58^{A}	1.07^{A}	0.84^{A}
Organomineral 100	42.50^{A}	39.50^{A}	34.91^{A}	4.02^{A}	0.58^{A}	2.18^{B}	0.80^{A}
Organomineral 120	43.86^{A}	33.61^{A}	31.11^{A}	2.20^{B}	0.31^{A}	0.71^{A}	0.53^{A}

Averages followed by different letters in column differ by Tukey test at 0.05.

Potatoes classified as Descarte and Boneca are devalued in the market because they do not reach the standards considered adequate. Therefore, for the Boneca class the use of mineral and organomineral fertilizer, with 40, 80 and 120%, obtained the best results, since the reduction in the production of these potatoes is more interesting. For the Descarte class, no differences were observed (Table 7).

Applying organomineral fertilizer to the potato cultivar Cupido, Bezerra et al. (2007) found no difference in productivity and in the classifications of the Especial, Primeira and Diversa potato tubers, only the potato classified as Segunda showed satisfactory results. No difference was observed in the productivity of the potato cultivar Ágata, submitted to different doses of organomineral fertilizer, compared with mineral fertilizer in the recommended dose for the crop. In the present case, the utilization of 40% of the amount of nutrients supplied by mineral fertilization via organomineral does not differ significantly from the production obtained with mineral fertilizer at the recommended dose for the crop.

Organomineral fertilizers promoted similar results to mineral fertilizer at the recommended dose for potato cultivation, demonstrating that the use of these organomineral sources, even at the lowest dose, can be an alternative in reducing the use of mineral sources, minimizing the pollution of the environment.

4. Conclusions

Organomineral fertilizer with 40% of the recommended dose for potato cultivation provides higher yield of tubers in the special potato class and higher accumulation of total dry mass, in addition to providing satisfactory productivity for the tubers of higher commercial value.

The use of organomineral fertilizers promotes the same behavior as mineral fertilizers, not interfering with potato development.

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