

**FORMULATION OF PELLETIZED COMPOST USING VARIOUS BINDERS**

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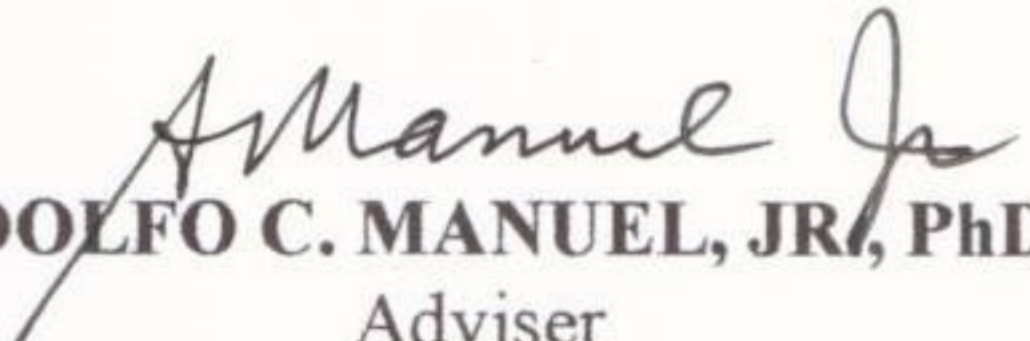
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## ABSTRACT

**LALAP, ALLAN F. Formulation of Pelletized Compost Using Various Binders.** Master's Thesis. Master of Science in Agriculture, major in Crop Science. Cavite State University, Indang, Cavite. August 2017. Adviser: Dr. Adolfo C. Manuel, Jr.

This study was conducted to produce pelletized compost using various binders. It dealt strictly with testing the suitability of starches from arrowroot (*Maranta arundinacea*) and cassava (*Manihot esculenta*) as binding materials in pelletizing compost compared with a commercial synthetic pellet binder (Calcium lignosulfonate). Likewise the study also determined the optimum level of binding materials in pelletizing the organic fertilizer. It also identified which organic starch will have comparable effect in pelletization with that of commercial binder in terms of pellet durability and bulk density. Finally, nutrient contents (N, P, K, micronutrients and organic carbon) of the pelletized compost after inclusion of various binders with varying levels of inclusion were compared.

The composting and pelletization was done at the Marinduque State College, Torrijos, Marinduque. The factors used in this study were the binders used and the different levels of inclusion. The compost produced through anaerobic composting was mixed with three types of binder: calcium lignosulfonate, arrowroot starch, and cassava starch with four levels of inclusion: 2%, 5%, 8%, and 10%. Pelletization was done using an extruder-type pelletizing machine. Arrowroot starch, cassava starch and calcium lignosulfonate were tested suitable as binding material in making pelletized compost. Mechanical properties were determined for the produced pellets.

The average durability of pellets expressed as the Pellet Durability Index was

90.13  $\pm$  1.82%. The average pellet bulk density was 535  $\pm$  14.69g/cm<sup>3</sup>. An inclusion level of 2% calcium lignosulfonate was sufficient to improve pellet durability and bulk density. For most parameters evaluated, cassava starch used at 10% inclusion level revealed to be comparable with the commercial synthetic binder. Nutrient content of the pelletized compost was also analyzed. The average value of total NPK was 2.13  $\pm$  0.339%; total Organic Carbon was 9.87  $\pm$  1.78%; pH was 7.42  $\pm$  0.5563; micronutrients were 154.02  $\pm$  26.69ppm for Zn, 72.16  $\pm$  14.58ppm for Cu, 375.83  $\pm$  50.95ppm for Mn, and 7,906.38  $\pm$  914.28ppm for Fe at an average moisture content of 33.49  $\pm$  1.23%.

## TABLE OF CONTENTS

	Page
<b>TITLE PAGE</b> .....	i
<b>APPROVAL SHEET</b> .....	ii
<b>BIOGRAPHICAL DATA</b> .....	iii
<b>ACKNOWLEDGMENT</b> .....	iv
<b>ABSTRACT</b> .....	vi
<b>LIST OF TABLES</b> .....	x
<b>LIST OF APPENDIX TABLES</b> .....	xi
<b>LIST OF APPENDIX FIGURES</b> .....	xiii
<b>INTRODUCTION</b> .....	1
Statement of the Problem.....	4
Objectives of the Study.....	5
Significance of the Study.....	5
Scope and Limitation .....	6
Time and Place of the Study.....	7
<b>REVIEW OF RELATED LITERATURE</b> .....	8
<b>METHODOLOGY</b> .....	23
Experimental Design .....	23
Composting .....	24
Preparation of Compost prior to Pelletization .....	24
Sampling and Laboratory Analysis .....	24
Preparation of Binders .....	24
Production of Pelletized Compost .....	25
Testing of Pelletized Compost .....	25
Analysis of Data .....	26
<b>RESULTS AND DISCUSSION</b> .....	27
Nutrient Analysis of Bulk Compost .....	27
Mechanical Analysis of Pelletized Compost .....	29
Pellet Durability Index .....	29

Bulk Density .....	31
Chemical Analysis of Pelletized Compost .....	33
Nitrogen .....	33
Phosphorus .....	34
Potassium .....	36
pH .....	37
Organic Carbon .....	39
Micronutrients .....	40
Moisture Content .....	45
Cost to produce a kilogram of pelletized compost.....	47
<b>SUMMARY, CONCLUSION AND RECOMMENDATION.....</b>	<b>49</b>
Summary.....	49
Conclusion.....	50
Recommendation.....	50
<b>REFERENCES.....</b>	<b>52</b>
<b>APPENDICES.....</b>	<b>55</b>

## LIST OF TABLES

Table		Page
1	Result of compost analysis.....	27
2	Pellet durability as affected by types of binder and level of inclusion, %.....	29
3	Bulk density as affected by types of binder and level of inclusion, %.....	31
4	Nitrogen as affected by types of binder and level of inclusion, %.....	33
5	Phosphorus as affected by types of binder and level of inclusion, %.....	35
6	Potassium as affected by types of binder and level of inclusion, %.....	36
7	pH as affected by types of binder and level of inclusion.....	37
8	Organic Carbon as affected by types of binder and level of inclusion, %.....	40
9	Zinc content of pelletized compost as affected by types of binder and level of inclusion, ppm.....	42
10	Copper content of pelletized compost as affected by types of binder and level of inclusion, ppm.....	43
11	Manganese content of pelletized compost as affected by types of binder and level of inclusion, ppm.....	44
12	Iron content of pelletized compost as affected by types of binder and level of inclusion, ppm.....	45
13	Moisture content as affected by types of binder and level of inclusion, %.....	46
14	Cost to produce a kilogram of pelletized compost, ₱.....	48

## LIST OF APPENDIX TABLES

Appendix Table		Page
1	Philippine National Standards for Organic Fertilizers (BAFPS, 2016).	57
2	ANOVA Table for Pellet Durability Index in response to different types of binder and level of inclusion.....	57
3	ANOVA Table for Bulk Density in response to different types of binder and level of inclusion.....	57
4	ANOVA Table for N in response to different types of binder and level of inclusion.....	58
5	ANOVA Table for P in response to different types of binder and level of inclusion.....	58
6	ANOVA Table for K in response to different types of binder and level of inclusion.....	58
7	ANOVA Table for pH in response to different types of binder and level of inclusion.....	59
8	ANOVA for Organic Carbon in response to different types of binder and level of inclusion.....	59
9	ANOVA for Zinc in response to different types of binder and level of inclusion.....	59
10	ANOVA for Copper in response to different types of binder and level of inclusion.....	60
11	ANOVA for Manganese in response to different types of binder and level of inclusion.....	60
12	ANOVA for Iron in response to different types of binder and level of inclusion.....	60

13	ANOVA Table for Moisture Content in response to different types of binder and level of inclusion.....	61
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## LIST OF APPENDIX FIGURES

Figure	Page
1 Gathering of raw materials for composting.....	63
2 Shredding of raw materials.....	64
3 Preparation of compost activator (EM1®).....	65
4 Spraying of Activated EM1®.....	65
5 Mixing of compost pile and placing in 68-liter tumbler with lid...	66
6 Sieving of bulk compost.....	66
7 Preparation of binding materials.....	67
8 Weighing of binding materials.....	68
9 Pelletization of compost.....	68
10 Air-drying of pelletized compost.....	69
11 Thirty-nine (39) composite samples submitted to the Regional Soils Laboratory for nutrient analysis.....	70
12 Pellet Durability Index Test.....	71
13 Bulk Density Test.....	72
14 Nutrient Analysis of Pelletized Compost.....	73
15 The Compost Pelletization Process.....	79