PROCESSING COFFEE GROUNDS FOR PLANT POTS DESIGN

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ABSTRACT

The purpose of this research is to experiment and discover coffee grounds-forming techniques. For use as a guideline for designing plant pots. The research methods include studying and analyzing coffee grounds data. Principles of designing plant pots from coffee grounds. By studying sources Research articles, including data obtained from research on Internet media, are then analyzed and summarized to guide experiments and design. Materials that can be used to bind coffee grounds include damar and lime by mixing coffee grounds with damar and lime in different ratios and using powder grout poured between layers. The process creates a unique product, and experiments have shown that a large ratio of binders is required for the coffee grounds to form and not cause the grounds to fall off. But in this research, which is processed into houseplants, the crumbly coffee grounds can be used as fertilizer for plants in the area and can be used to repel pests and ants. In addition to processing waste, it also creates added value.

Keywords: Design, Plant Pot, Coffee Grounds, Material

INTRODUCTION

Design principles are problem-solving activities to achieve the goals for the set purpose. As design principles are human actions to meet needs or achieve something new, the importance of design principles is therefore a prerequisite to a successful production process of goods or products. Therefore, design is something created by humans, where elements are arranged to create new shapes that can meet the needs of the creator and are produced with existing materials and production methods (Teachernu, 2018).

Waste materials found in Thailand Coffee is the second most traded commodity after petroleum, and coffee drinking is becoming widely popular in Thailand, both from cafes and instant coffee from the industrial sector, as well as from coffee culture and lifestyle within households. The value of the coffee industry in Thailand in 2018 reached 17 billion baht. Coffee is produced at 20,000 tons/year, but not only per consumption, which is up to 120,000 tons/year, and on average, Thais consume about 0.5–1.0 kg/year. It is predicted that by 2022, coffee consumption in Thailand will reach 300,000 tons per year (Nattapong Tantiwattanapan, 2019). Thus, it can be seen that coffee consumption can grow further. As a result, there is an increase in waste materials from coffee extraction (Yanko Design, 2018).

Coffee grounds in the instant coffee production sector deal with waste coffee grounds by burning them because industrial coffee grounds contain oil and therefore have heat-conducting properties to provide energy that can be used instead of charcoal. In the household sector and coffee shop business, most of them use the method of disposing or distributing to consumers who want to make good use of coffee grounds.

Based on this information, they are interested in studying waste coffee grounds as a material for use in plant pot design. This will be a new creation that can help solve the problem of waste materials in the coffee shop business. Industrial production of instant coffee powder household consumption of coffee and the reuse of waste materials from coffee are worthwhile. And get the most out of it in another way.

OBJECTIVES

1.) To experiment with the processing of coffee grounds for use as a material for plant pot design.

2.) To design plant pots from coffee grounds.

RESEARCH SCOPES

Content scope

1. Study the properties of coffee grounds.
2. Principles of plant pot design.
3. Composite materials used in the design of plant pots

Scope of design**.**

Plant pots from coffee grounds**.**

METHODOLOGY

This research is a qualitative research with the following steps:

1. Collect information from relevant documents, books, and research, including information obtained from research on Internet media. The study focuses on coffee grounds data. The principles of plant pot design are then analyzed and summarized to be used as a design guide.

2. Experimenting with coffee grounds processing to find guidelines for designing plant pots.

3. Plant pot design.

RESULT

Experimental process of forming coffee grounds.

Table 1: Experimental process of forming coffee grounds.

material	ratio	figure	result
Coffee grounds / Rubber	4:1		- dries quickly; - strong smell; -elastic
Coffee grounds / cement	2:1		- Cracked skin -stink

material	ratio	figure	result
Coffee grounds / Powder grout	2:1		- smells of coffee; - Can be molded - Can be exposed to water
Coffee grounds / Coarse sand / cement	2:2:1		- Cracked skin -stink
Coffee grounds / Coarse sand / Powder grout	2:2:1		- The skin has air holes. - Light color - smells of coffee
Coffee grounds / damar	2:1		- Dry with weather conditions. - Smooth surface

From Table 1, it can be concluded that the coffee grounds are crumbly. Therefore, it cannot be molded with some binders. A large ratio is needed for coffee grounds to form.

Table 2: Coffee grounds processing experiment

material	ratio	figure	result
Coffee grounds : Powdered grout	4:1		The top layer is biodegradable.
Coffee grounds : Sand : Powder grout	2:2:1		
Sand : Powder grout	2:1		
Powder grout	1		
Coffee grounds : Powdered grout	3:1		The top layer is biodegradable.
Coffee grounds : Sand : Powder grout	2:2:1		
Sand : Powder grout	2:1		
Coffee grounds : Grout	4:1		The top layer is biodegradable.

material	ratio	figure	result
Coffee grounds : Grout	1:2		

From Table 2, if less binder material is used, when the coffee grounds are dry, they will crumble on your hands, putting crumbly coffee grounds into the ground. It can be used as fertilizer for plants in such areas and can be used to repel pests and ants.

Table 3: Summary of coffee grounds processing process guidelines

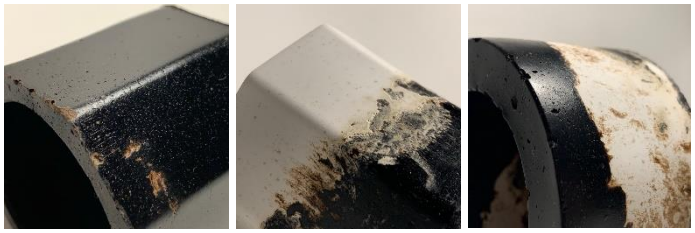
process	Resulting characteristics
Process 1 1. Mix the powder grout with water well and pour it onto the mold in the first layer. 2. Mix coffee grounds with powdered grout in a ratio of 1:1 and pour it onto the mold. 3. On the top layer, mix coffee grounds with powdered grout in a ratio of 4:1 and pour on mold. Once poured, shake the mold again and leave it to dry in the sun.	
Process 2 1. Mix the powder grout with water well and pour it onto the mold in the first layer. 2. Mix the coffee grounds with the slopes in a ratio of 2:1 and pour them on the mold. 3. On the top layer, mix the powder grout with water and pour it on the mold. Once poured, shake the mold again and leave to dry with air.	

Table 3 concludes that in the first experiment of coffee grounds processing, shaking the mold creates texture on the lime surface that can be used to make plant pot products, and some of them are biodegradable and can be used as fertilizer for plants in the area. In the second process, coffee grounds, damar, and powder grout can create texture on the surface, but if there is still a problem, some materials are still sticky if they are made into potted plant products from coffee grounds.

Design and development

Guidelines for designing plant pots from coffee grounds It takes the differences between different types of coffee, the tone and layer of the coffee, as well as the ingredients of each type of coffee, as inspiration. The mixture will create colors and patterns, as shown in Figure 1.

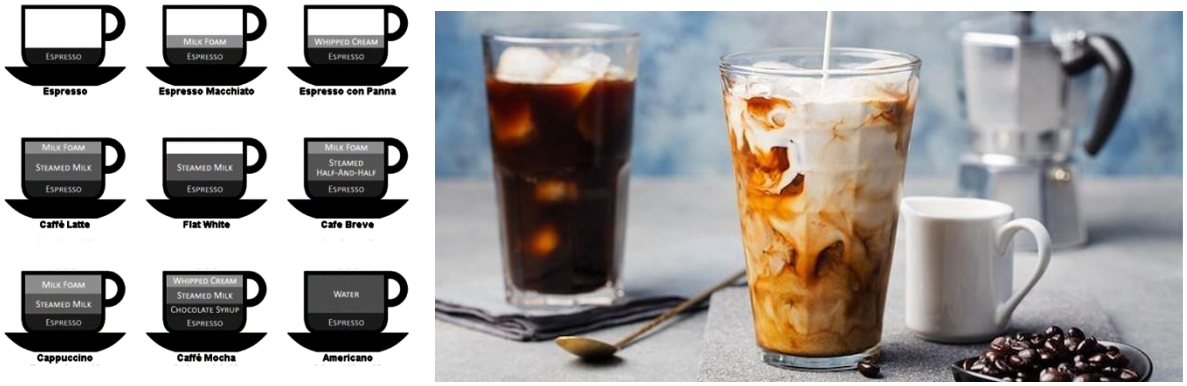


Figure 1. The image represents design inspiration
origin : Arunsri Karnmana. (2023). Retrieved on December 23, from the website : https://th.theasianparent.com/ice-coffee-home-made

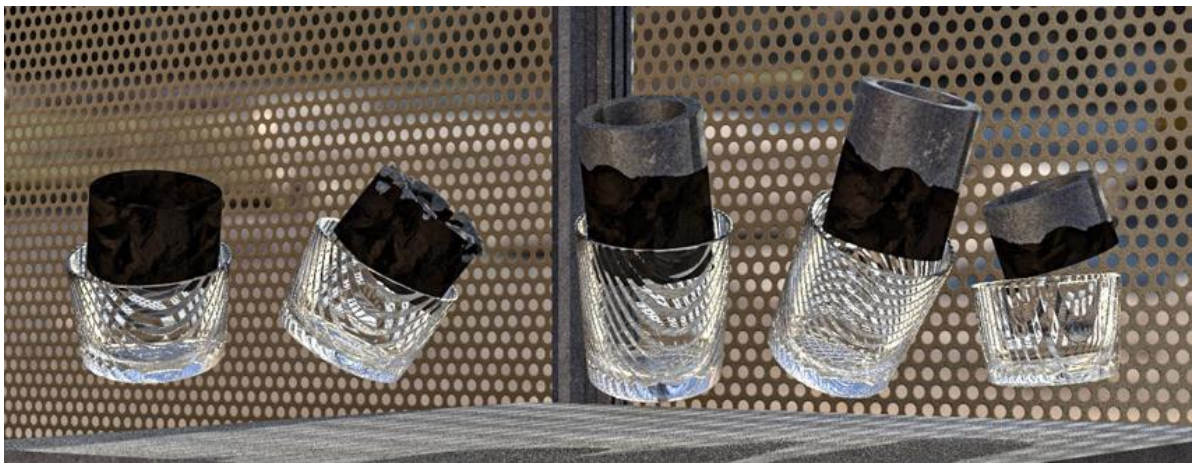


Figure 2. The image shows a sketch with a 3D program.

Production Procedure

1.) Prepare the coffee grounds. 2.) Dry the resulting coffee grounds in the sun. 3.) Sift the dried coffee grounds. 4.) Pour in the coffee grounds and mix them with the damar. 5.) Pour natural resin over the coffee grounds, damar, and stir them together. 6.) Pour in the coffee grounds in a mold. Alternating layers with lime until the mold is filled. After that, stir to create a pattern, then shake the mold so that the coffee grounds, damar, and lime are combined.

Figure 3. The picture shows the prototype product

CONCLUSIONS AND DISCUSSIONS

From the experiment of forming coffee grounds. Coffee grounds were found to be crumbly. Materials that can be used to bind coffee grounds include damar and lime by mixing coffee grounds with damar and lime in different ratios and using powder grout poured between layers. This process creates a unique product that can differentiate the image of the product and stimulate consumer interest. As Akapong Inkuer (2023) According to the guidelines, most of the images that are of interest to consumers today are products that come from wisdom and are made from natural materials, and experiments have also shown that a large ratio of binders is required for coffee grounds to form. But in this research, which is processed into houseplants. The crumbly coffee grounds can be used as fertilizer for plants in the area and can be used to repel pests and ants. In addition to processing waste. It also creates added value.

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