lab book.

A GUIDE FOR INNOVATIVE MATERIALS

EDITED BY
NICLA GUARINO

POLITECNICO
MILANO 1863
DIPARTIMENTO DI DESIGN

lab book.

A GUIDE FOR INNOVATIVE MATERIALS

This lab book is a tinkering diary developed during the research thesis for the Master of Science Degree in *Design for the Fashion System* at Politecnico di Milano.

Supervisor

Prof. Valentina Rognoli

Professor in the Design Department, Politecnico di Milano

Co-supervisor

Dr. Stefano Parisi

Postdoc, TU Delft, Faculty of Industrial Design Engineering

Author

Nicla Guarino

April 2022

content

part 07

INTRODUCTION

abstract.

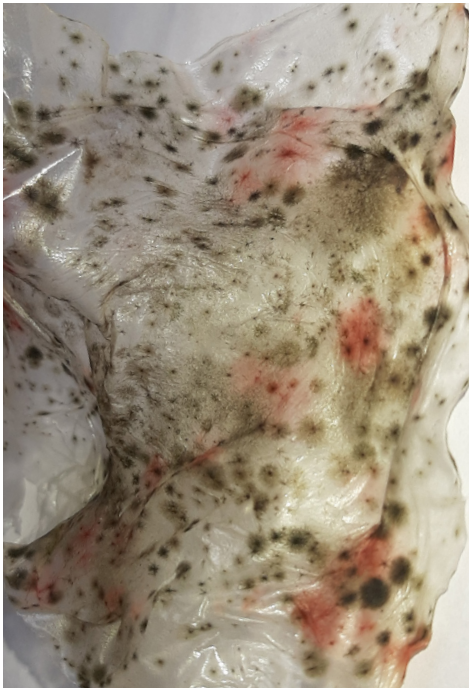
This lab book is born from the idea to share the personal knowledge derived form my Master of Science Thesis' sperimentation. It can be considered as a guide of experiments and testings that explore the innovative materials area. Specifically, the world of bioplastics and plants was the focus of the material research.

Part 01 proposes a general introduction of the following sections, providing an overview of investigated materials and the tools utilised to create them.

Bio-based materials testings and particularly bioplastics are deepened in **Part 02**. The 'recipe' of each sample will be offered with its composition, notes, suggestions and more.

Living design and growing materials will be the subject of **Part 03**. Effectively, the attention is given a definite group of living sources, plants. Thus, different seeds have been tested in combination with several substrates.

Part 04 is about three main testings made for the final project of the Master's thesis, *reGrowth*, with the aim to show bio-based materials' behaviour in certain contexts. In particular, the biodegradability and the resistance of the final samples have been verified and outlined to define some results.



overview.

BIO-BASED MATERIALS

main components

AGAR

Agar is a gelling agent, originally used in Asian cuisines and now is common all over the world.

GELATINE

Gelatine is the most known plasticizer in the production of jelly-based foods such as aspic or desserts.

SODIUM ALGINATE

Sodium alginate, also identified as E401, is used a lot in molecular grastronomy as spherification.

CHARCOAL

Activated charcoal is a useful material, especially applicable in biomaterials, thanks to its conductive and purifying properties.

STARCH

Starch is a natural polymer used especially in cooking and other applications such as injection molding, or extrusion.

PECTIN

Pectin is a natural polysaccharide extracted from plants and fruits for different applications, i.e. food packaging.

results:

50 TOTAL RECIPES

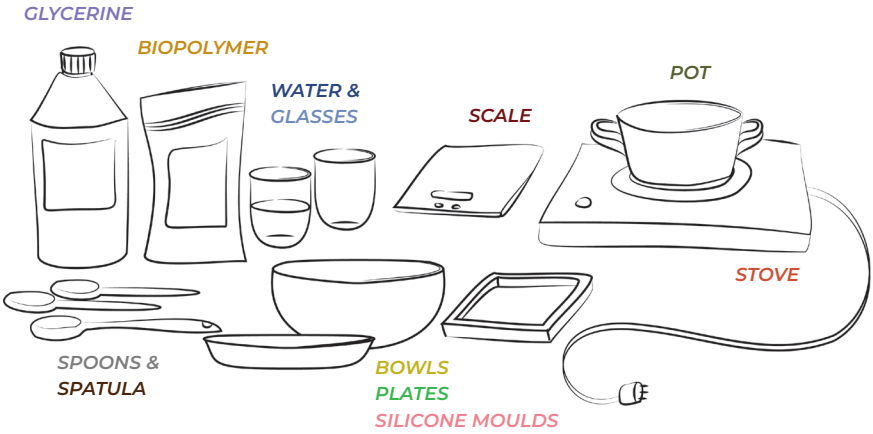
13 SELECTED MATERIALS FOR THE FASHION FIELD

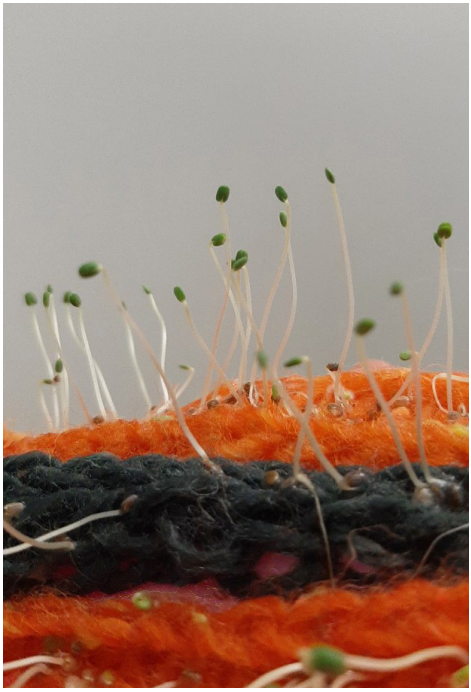
5 SELECTED MATERIALS FOR THE PROJECT

results & tools.

BIO-BASED MATERIALS

main tools & ingredients





overview.

GROWING MATERIALS

textiles and materials

COTTON PADS

COTTON WOOL

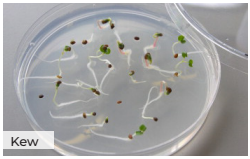
COTTON CANVAS

PAPER TOWEL

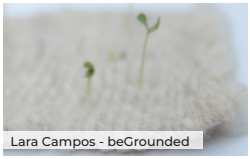
COTTON YARN

WOOL FELT

AGAR SUBSTRATE



KNIT WOOL

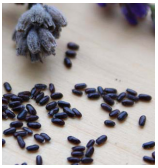


easy to grow seeds

CATNIP
GERMINATION: 7-10 days

CHIA
GERMINATION: 3-14 days

LAVENDER
GERMINATION: 15-30 days

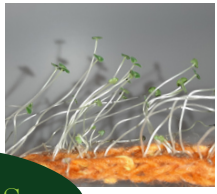


LEMON
GERMINATION: 7-9 days

SUNFLOWER
GERMINATION: 10-14 days

results:

16 TOTAL TRIALS



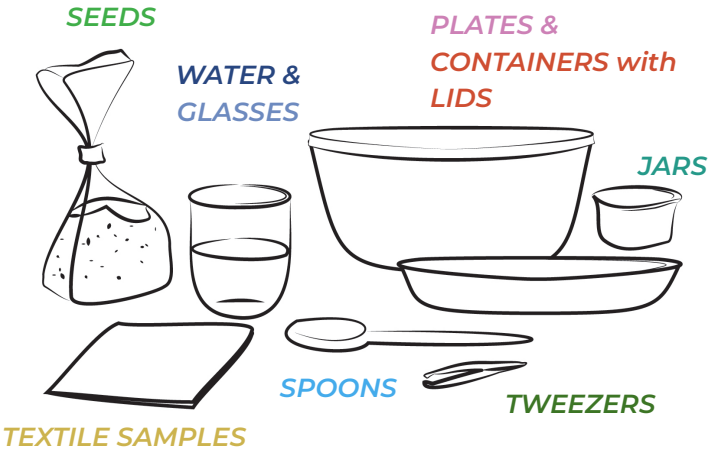
BEST SEEDS:

CHIA SEEDS

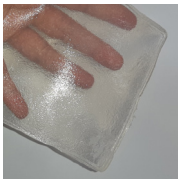
results & tools.

GROWING MATERIALS

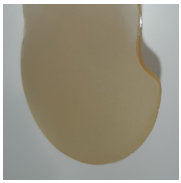
main tools & ingredients



selected bio-based materials



recipe n.3
AGAR-BASED



recipe n.19
GELATINE-BASED

recipe n.27
ALGINATE-BASED

recipe n.39
POTATO STARCH-BASED

recipe n.45
CORN STARCH-BASED

selected seeds

chia seeds

on the top of the substrate **A**

B inside the substrate

overview.

MATERIALS TESTINGS

biomaterials + chia seeds

hot water

- Water resistance of biomaterials
- Seeds endurance to the biomaterials production process

testing tools

- Selected biomaterials
- Two glass bowls
- Pot
- Water
- Other containers *if needed*

potting soil

- Compostability of biomaterials
- Timing of decomposition

testing tools

- Selected biomaterials
- Potting soil
- Pots
- Water *if needed*

garden soil

- Compostability of biomaterials
- Timing of decomposition

testing tools

- Selected biomaterials
- Garden soil
- Pots *if needed*
- Water *if needed*

final bio-based materials

AGAR

DATE OF PRODUCTION
04/12/2021

GELATINE

DATE OF PRODUCTION
04/12/2021

ALGINATE

DATE OF PRODUCTION
05/12/2021

overview.

MATERIALS TESTINGS

POTATO STARCH

DATE OF PRODUCTION
01/12/2021

#4A

#4B

CORN STARCH

#5A

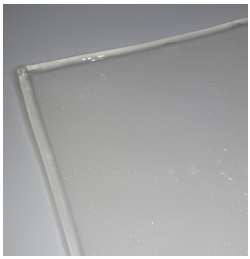
#5B

DATE OF PRODUCTION
01/12/2021

part 2

BIO-BASED MATERIALS

recipe n.1

Composition

Water	*200 ml*
Agar-agar powder	*1 teaspoon*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it in a mould and leave it dry in a place with air flow.

General info

DATE
27/09/2021

PREPARATION TIME
30 minutes

PROCESSING TIME
7-10 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
23%

THICKNESS
8%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	100 mm x 100 mm
THICKNESS	6 mm	0.5 mm
STRENGTH	None	None
FLEXIBILITY	None	Low
ELASTICITY	None	Low
WEIGHT	Medium	Light
COLOUR	Uncoloured	Whitish with mold spots
TRANSPARENCY	High	High
GLOSSINESS	High	Medium
TEXTURE	Smooth	Wrinkled
ODOR	None	None
STICKINESS	High	None
RUBBERINESS	High	None
WATER REPELLENCY	Low	Low
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

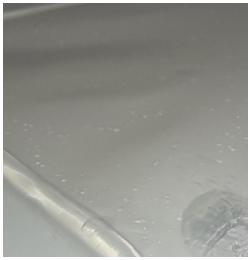
- The material was not properly dried: mold grew on the surface → the surface could be treated with vinegar
- Once dried, the material shrinks and became opaque and less flexible

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Creating Edible Bioplastic Bags from Agar - Organic Chemistry Project by Monavi Barthakur https://www.youtube.com/watch?v=asfZzra-hqw&t=171s*

recipe n.2




Composition

Water	*200 ml*
Agar-agar powder	*1 teaspoon*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a baking paper foil and leave it dry in a place with air flow.

General info

DATE
27/09/2021

PREPARATION TIME
30 minutes

PROCESSING TIME
3-6 days

MOULD
Baking paper sheet

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
8-10%

THICKNESS
5%

Tools

Stove
Scale
Bowls
Pot
Baking paper foil
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Uneven	Uneven
THICKNESS	4 mm (Uneven)	0.2 mm
STRENGTH	Low	None
FLEXIBILITY	Low	Low
ELASTICITY	None	Low
WEIGHT	Light	Light
COLOUR	Uncoloured	Whitish
TRANSPARENCY	High	High
GLOSSINESS	High	Medium
TEXTURE	Smooth	Slightly smooth
ODOR	None	None
STICKINESS	High	None
RUBBERINESS	High	None
WATER REPELLENCY	Low	Low
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

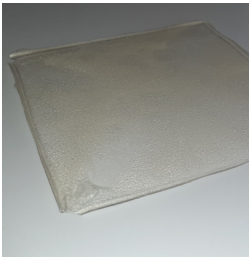
- Once dried, the material shrinks and becomes very fragile and a little opaque

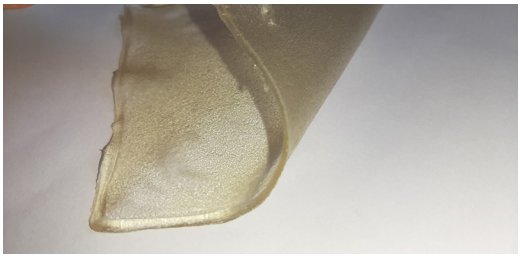
SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Creating Edible Bioplastic Bags from Agar - Organic Chemistry Project by Monavi Barthakur https://www.youtube.com/watch?v=asfZzra-hqw&t=171s*

recipe n.3





Composition

Water	*40 ml*
Agar-agar powder	*2 g*
Glycerine	*8 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a plate and leave it dry in a place with air flow.

General info

DATE
27/09/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
25%

THICKNESS
56%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	95 mm x 100 mm
THICKNESS	4 mm	1.2 mm
STRENGTH	Medium	Medium
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	Uncoloured	Yellowish
TRANSPARENCY	High	Medium
GLOSSINESS	Medium	Medium
TEXTURE	Smooth	Grainy
ODOR	None	None
STICKINESS	High	Low
RUBBERINESS	High	None
WATER REPELLENCY	Low	Low
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- Once dried, the material shrinks and becomes a little opaque, grainy and yellowish

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastic Cook Book by Margaret Dunne https://issuu.com/nat_arc/docs/bioplastic_cook_book_3*

recipe n.4




Composition

Water	*40 ml*
Agar-agar powder	*2 g*
Glycerine	*8 g*
Lavender seeds	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, add some lavender seed, stir the solution and pour it on a mould.
Leave it dry in a place with air flow.

General info

DATE
13/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Silicone surface

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
8-10%

THICKNESS
10%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Uneven	Uneven
THICKNESS	2 mm	1.2 mm
STRENGTH	Low	Low
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Light	Light
COLOUR	Uncoloured	With yellowish halos
TRANSPARENCY	High	High
GLOSSINESS	High	High
TEXTURE	Smooth	Grainy
ODOR	None	None
STICKINESS	High	Low
RUBBERINESS	High	None
WATER REPELLENCY	Low	Low
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- Once dried, the material shrinks and becomes grainy and a little yellowish
- Lavender seeds released light yellowish haloss

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastic Cook Book by Margaret Dunne https://issuu.com/nat_arc/docs/bioplastic_cook_book_3*

recipe n.5




Composition

Water	*160 ml*
Agar-agar powder	*2 g*
Glycerine	*8 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a mould and leave it dry in a place with air flow.

General info

DATE
13/10/2021

PREPARATION TIME
30 minutes

PROCESSING TIME
7-10 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
25%

THICKNESS
80%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 112 mm
THICKNESS	5 mm	1 mm
STRENGTH	Low	Low
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	Uncoloured	Yellowish
TRANSPARENCY	Medium	High
GLOSSINESS	High	High
TEXTURE	Smooth	Slightly grainy
ODOR	None	None
STICKINESS	High	Low
RUBBERINESS	High	None
WATER REPELLENCY	Low	Low
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- Once dried, it shrinks and becomes grainy and yellowish

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastic Cook Book by Margaret Dunne https://issuu.com/nat_arc/docs/bioplastic_cook_book_3*

recipe n.6

Composition

Water	*60 ml*
Agar-agar powder	*2.5 g*
Lavender buds	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, add a small quantity of lavender buds and stir the solution.
Pour it on a plate and leave it dry in a place with air flow.

General info

DATE
28/09/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
7-10 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
19%

THICKNESS
80%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	105 mm x 105 mm
THICKNESS	5 mm	1 mm
STRENGTH	Medium	Medium
FLEXIBILITY	None	None
ELASTICITY	High	None
WEIGHT	Medium	Light
COLOUR	Uncoloured	With yellowish halos
TRANSPARENCY	Medium	Low
GLOSSINESS	Medium	Low
TEXTURE	Smooth	Wrinkled
ODOR	Low	None
STICKINESS	High	None
RUBBERINESS	High	None
WATER REPELLENCY	Low	Low
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

- The material was not properly dried: mold grew on the surface → the surface could be treated with vinegar
- Once dried, the material shrinks and become opaque and lavander buds released brownish halos

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastic Cook Book by Margaret Dunne https://issuu.com/nat_arc/docs/bioplastic_cook_book_3*

recipe n.7




Composition

Water	*60 ml*
Agar-agar powder	*2.5 g*
Glycerine	*6 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a plate and leave it dry in a place with air flow.

General info

DATE
28/09/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
7-10 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
31%

THICKNESS
80%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	90 mm x 90 mm
THICKNESS	5 mm	1 mm
STRENGTH	Medium	Medium
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	Uncoloured	Yellowish
TRANSPARENCY	Medium	Low
GLOSSINESS	Medium	Low
TEXTURE	Smooth	Grainy
ODOR	None	None
STICKINESS	High	Low
RUBBERINESS	High	Medium
WATER REPELLENCY	Low	Low
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- The material was not properly dried: mold grew on the surface → the surface could be treated with vinegar
- Once dried, the material shrinks and becomes opaque and yellowish

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastic Cook Book by Margaret Dunne https://issuu.com/nat_arc/docs/bioplastic_cook_book_3*

recipe n.8




Composition

Water	*60 ml*
Agar-agar powder	*2.5 g*
Glycerine	*11 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a plate and leave it dry in a place with air flow.

General info

DATE
28/09/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
9-12 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
19%

THICKNESS
80%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	105 mm x 105 mm
THICKNESS	5 mm	1 mm
STRENGTH	Medium	Medium
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	Uncoloured	Yellowish
TRANSPARENCY	Medium	Low
GLOSSINESS	Medium	Low
TEXTURE	Smooth	Grainy
ODOR	None	None
STICKINESS	High	Low
RUBBERINESS	High	Medium
WATER REPELLENCY	Low	Low
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- The material was not properly dried: mold grew on the surface → the surface could be treated with vinegar
- Once dried, the material shrinks and become opaque and yellowish

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastic Cook Book by Margaret Dunne https://issuu.com/nat_arc/docs/bioplastic_cook_book_3*

recipe n.9




Composition

Water	*250 ml*
Agar-agar powder	*5 g*
Glycerine	*15 g*
Lavender seeds	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a mould and leave it dry in a place with air flow.

General info

DATE
12/10/2021

PREPARATION TIME
45 minutes

PROCESSING TIME
7-10 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
35%

THICKNESS
64%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 98 mm
THICKNESS	5 mm	1.8 mm
STRENGTH	Medium	Medium
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Medium	Medium
COLOUR	Uncoloured	Yellowish
TRANSPARENCY	Medium	Medium
GLOSSINESS	Medium	Medium
TEXTURE	Smooth	Grainy
ODOR	None	None
STICKINESS	High	Low
RUBBERINESS	High	High
WATER REPELLENCY	Low	Low
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

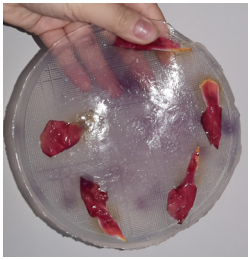
- Once dried, the material shrinks and become yellowish

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/agarfoil/*

recipe n.10




Composition

Water	*80 ml*
Agar-agar powder	*3 g*
Glycerine	*11 g*
Petals	*5 pcs*
Radish colorant powder	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a plate and add petals and colorant powder.
Leave it dry in a place with air flow.

General info

DATE
04/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
7-10 days

MOULD
Round plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
29%

THICKNESS
83%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 170 mm	Ø 120 mm
THICKNESS	6 mm	1 mm
STRENGTH	Medium	Medium
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	Shaded red	Shaded red & yellowish
TRANSPARENCY	Medium	Low
GLOSSINESS	High	Medium
TEXTURE	Smooth	Smooth/Checked
ODOR	None	None
STICKINESS	High	Low
RUBBERINESS	High	Medium
WATER REPELLENCY	Low	Low
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- The material was not properly dried: mold grew on the surface → the surface could be treated with vinegar
- Once the material is completely dried, it shrinks a little and becomes opaque and yellowish

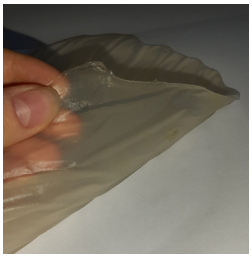
SUSTAINABLE TAGS

- RENAWABLE INGREDIENTS
- VEGAN INGREDIENTS
- WASTE COMPONENTS
- BIOCOMPOSTABLE INGREDIENTS
- RE-USE

REFERENCE: *Bioplastic Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/agar-agar.html*

recipe n.11



Composition

Water	*160 ml*
Agar-agar powder	*3 g*
Gelatine powder	*3 g*
Glycerine	*22 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a baking paper foil and leave it dry in a place with air flow.

General info

DATE
04/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
7-10 days

MOULD
Baking paper sheet

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
10-15%

THICKNESS
60%

Tools

Stove
Scale
Bowls
Pot
Baking paper foil
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Uneven	Uneven
THICKNESS	3 mm	1.2 mm
STRENGTH	Medium	Medium
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	Uncoloured	Yellowish
TRANSPARENCY	Medium	Medium
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth and waved	Smooth and waved
ODOR	Low	Low
STICKINESS	High	Low
RUBBERINESS	High	Medium
WATER REPELLENCY	Low	Low
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- Once dried, the material shrinks and becomes yellowish

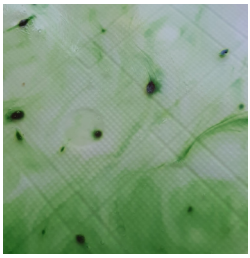
SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastic Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/agar-agar.html*

recipe n.12






Composition

Water	*160 ml*
Agar-agar powder	*3 g*
Gelatine powder	*3 g*
Glycerine	*22 g*
Safflower colorant powder	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a plate and add some colorant powder. Leave it dry in a place with air flow.

General info

DATE
04/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
7-10 days

MOULD
Round plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
15%

THICKNESS
80%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 170 mm	Ø 145 mm
THICKNESS	4 mm	0.8 mm
STRENGTH	Low	Low
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	Shaded green	Shaded green & yellowish
TRANSPARENCY	Medium	Medium
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth	Smooth/Checked
ODOR	Low	Low
STICKINESS	High	Low
RUBBERINESS	High	Medium
WATER REPELLENCY	Low	Low
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- The material was not properly dried: mold grew on the surface → the surface could be treated with vinegar
- Once the material is completely dried, it shrinks a little and becomes more shaded

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastic Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/agar-agar.html*

recipe n.13

Composition

Water	*160 ml*
Agar-agar powder	*3 g*
Gelatine powder	*3 g*
Glycerine	*22 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a mould and leave it dry in a place with air flow.

General info

DATE
12/10/2021

PREPARATION TIME
25 minutes

PROCESSING TIME
7-10 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
17%

THICKNESS
16%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 124 mm
THICKNESS	1.2 mm	1 mm
STRENGTH	None	None
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Light	Light
COLOUR	Uncoloured	Yellowish
TRANSPARENCY	High	High
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth	Smooth
ODOR	Low	Low
STICKINESS	High	High
RUBBERINESS	High	High
WATER REPELLENCY	Low	Low
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

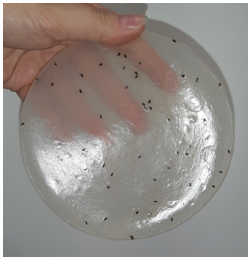
- Once the material is completely dried, it shrinks a little and becomes yellowish

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/agarfoil/*

recipe n.14




Composition

Water	*160 ml*
Agar-agar powder	*3 g*
Gelatine powder	*3 g*
Glycerine	*22 g*
Lavender seeds	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, add lavender seeds and pour it on a mould.
Finally, leave it dry in a place with air flow.

General info

DATE
12/10/2021

PREPARATION TIME
25 minutes

PROCESSING TIME
7-10 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
20%

THICKNESS
60%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 120 mm
THICKNESS	5 mm	2 mm
STRENGTH	Low	Low
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	Uncoloured	Yellowish
TRANSPARENCY	High	High
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth	Smooth
ODOR	Low	Low
STICKINESS	High	High
RUBBERINESS	High	High
WATER REPELLENCY	Low	Low
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

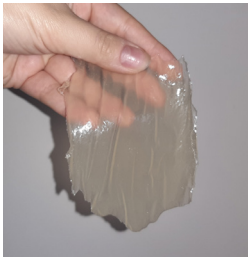
- Once the material is completely dried, it shrinks a little and becomes yellowish

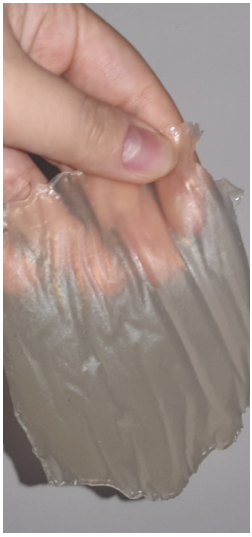
SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/agarfoil/*

recipe n.15





Composition

Water	*80 ml*
Gelatine powder	*12 g*
Glycerine	*7.2 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a baking paper foil and leave it dry in a place with air flow.

General info

DATE
04/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Baking paper sheet

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
20-35%

THICKNESS
50%

Tools

Stove
Scale
Bowls
Pot
Baking paper foil
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Uneven	Uneven
THICKNESS	5 mm	2.5 mm
STRENGTH	Medium	Medium
FLEXIBILITY	High	Medium
ELASTICITY	High	Medium
WEIGHT	Medium	Light
COLOUR	Yellowish	Yellowish
TRANSPARENCY	Medium	Low
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth and waved	Smooth and waved
ODOR	Medium	Low
STICKINESS	High	None
RUBBERINESS	High	Medium
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

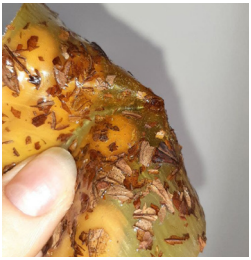
- Once the material is completely dried, it shrinks a little and becomes opaque and yellowish

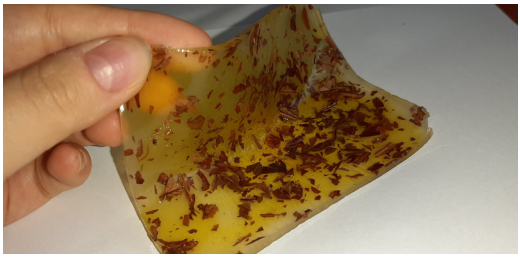
SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastic Cookbook by Tiare Ribeaux* http://bioplastic-cookbook.schloss-post.com/gelatin.html

recipe n.16





Composition

Water	*80 ml*
Gelatine powder	*12 g*
Glycerine	*7.2 g*
Dried leaves	*q.s.*
Lemon colorant powder	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it inside the mould and leave it dry in a place with air flow.

General info

DATE
04/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Rectangle plastic mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
21%

THICKNESS
56%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	110 mm x 80 mm	85 mm x 65 mm
THICKNESS	5 mm	2.2 mm
STRENGTH	Medium	Medium
FLEXIBILITY	High	Medium
ELASTICITY	High	Medium
WEIGHT	Medium	Light
COLOUR	Yellow with red leaves	Yellow with red leaves
TRANSPARENCY	Low	Low
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Rough	Rough
ODOR	Medium	Low
STICKINESS	High	None
RUBBERINESS	High	Medium
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

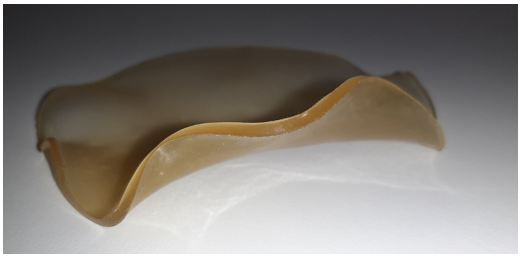
- Once the material is completely dried, it shrinks making the surface very rough

SUSTAINABLE TAGS

- RENAWABLE INGREDIENTS
- VEGAN INGREDIENTS
- WASTE COMPONENTS
- BIOCOMPOSTABLE INGREDIENTS
- RE-USE

REFERENCE: *Bioplastic Cookbook by Tiare Ribeaux* http://bioplastic-cookbook.schloss-post.com/gelatin.html

recipe n.17



Composition

Water	*120 ml*
Gelatine powder	*24 g*
Glycerine	*4 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it inside the mould and leave it dry in a place with air flow.

General info

DATE
12/10/2021

PREPARATION TIME
30 minutes

PROCESSING TIME
5-14 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
23%

THICKNESS
50%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 110 mm
THICKNESS	6-2 mm (Uneven)	3-1 mm (Uneven)
STRENGTH	High	High
FLEXIBILITY	Low	None
ELASTICITY	Low	None
WEIGHT	Medium	Light
COLOUR	Yellow	Yellow
TRANSPARENCY	Medium	Medium
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth	Smooth
ODOR	Medium	Low
STICKINESS	Low	None
RUBBERINESS	Medium	None
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

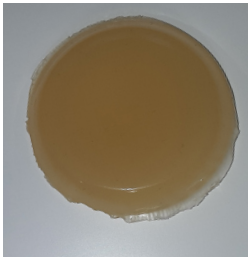
- Once the material is completely dried, it shrinks a lot
- The material is very strong and resistant, a good subsitute to chemical resins

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/bioresin/*

recipe n.18




Composition

Water	*120 ml*
Gelatine powder	*24 g*
Glycerine	*4 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it inside the mould and leave it dry in a place with air flow.

General info

DATE
12/10/2021

PREPARATION TIME
30 minutes

PROCESSING TIME
5-14 days

MOULD
Aluminum mould

PHYSICAL FORM
Solid

Shrinkage

WIDTH/LENGTH
27%

THICKNESS
20%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 55 mm	Ø 40 mm
THICKNESS	10 mm	8 mm
STRENGTH	High	High
FLEXIBILITY	Low	None
ELASTICITY	Low	None
WEIGHT	Medium	Light
COLOUR	Yellow	Yellow
TRANSPARENCY	Medium	Medium
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth	Smooth
ODOR	Medium	Low
STICKINESS	Low	None
RUBBERINESS	Medium	None
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

- Once the material is completely dried, it shrinks a lot
- The material is very strong and resistant, a good subsitute to chemical resins

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/bioresin/*

recipe n.19

Composition

Water	*120 ml*
Gelatine powder	*24 g*
Glycerine	*4 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
Let the solution boil and thicken. When it becomes thick and caramel-like in its texture, pour it inside the mould and leave it dry in a place with air flow.

General info

DATE
13/10/2021

PREPARATION TIME
50 minutes

PROCESSING TIME
5-14 days

MOULD
Aluminum mould

PHYSICAL FORM
Solid

Shrinkage

WIDTH/LENGTH
10%

THICKNESS
25%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 55 mm	Ø 5 mm
THICKNESS	8 mm	6 mm
STRENGTH	High	High
FLEXIBILITY	None	None
ELASTICITY	None	None
WEIGHT	Medium	Light
COLOUR	Yellow-amber	Amber
TRANSPARENCY	None	None
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth and bubblish	Smooth and bubblish
ODOR	Medium	Low
STICKINESS	Low	None
RUBBERINESS	Low	Medium
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

- Once the material is completely dried, it shrinks a lot
- The material is very strong and resistant, a good subsitute to chemical resins

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/bioresin/*

recipe n.20




Composition

Water	*60 ml*
Gelatine powder	*12 g*
Glycerine	*7 g*
Soap	*4 g*
Safflower colorant powder	*1 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it inside the plate and leave it dry in a place with air flow.

General info

DATE
28/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
4%

THICKNESS
4%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	125 mm x 125 mm
THICKNESS	6 mm	3.5 mm
STRENGTH	High	High
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	White & green	White & green
TRANSPARENCY	None	None
GLOSSINESS	Glossy/Foamy	Glossy/Foamy
TEXTURE	Smooth and foamy	Smooth and foamy
ODOR	Medium	Low
STICKINESS	Low	None
RUBBERINESS	Medium	Medium
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

- Once the material is completely dried, the foam shrinks a little

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastic Cook Book by Margaret Dunne https://issuu.com/nat_arc/docs/bioplastic_cook_book_3*

recipe n.21




Composition

Water	*60 ml*
Gelatine powder	*12 g*
Glycerine	*7 g*
Safflower colorant powder	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it inside the plate and leave it dry in a place with air flow.

General info

DATE
28/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
13%

THICKNESS
38%

Tools

Stove
Scale
Bowls
Cutter
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	113 mm x 113 mm
THICKNESS	4 mm	2.5 mm
STRENGTH	High	High
FLEXIBILITY	High	Medium
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	Green	Green
TRANSPARENCY	Medium	Medium
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth & embroidered	Smooth & embroidered
ODOR	Medium	Low
STICKINESS	Low	None
RUBBERINESS	Medium	Low
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

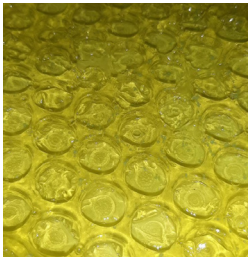
- The final piece has been adorned with an embroidery after four days of drying process

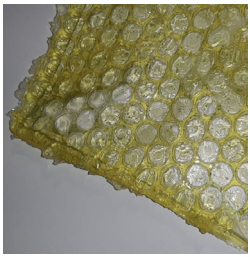
SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastic Cook Book by Margaret Dunne https://issuu.com/nat_arc/docs/bioplastic_cook_book_3*

recipe n.22






Composition

Water	*60 ml*
Gelatine powder	*12 g*
Glycerine	*7 g*
Safflower colorant powder	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
During the cooking process, place a piece of bubble-wrap on the plate.
When the solution starts to boil and slightly thicken, pour it on the bubble-wrap and leave it dry in a place with air flow.

General info

DATE
28/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
7%

THICKNESS
50%

Tools

Stove
Scale
Bowls
Bubble-wrap
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	120 mm x 120 mm
THICKNESS	6-3 mm (Uneven)	3-0.1 mm (Uneven)
STRENGTH	Medium	Medium
FLEXIBILITY	High	Low
ELASTICITY	High	Low
WEIGHT	Medium	Light
COLOUR	Green	Green
TRANSPARENCY	Medium	Medium
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth	Smooth
ODOR	Medium	Low
STICKINESS	None	None
RUBBERINESS	Medium	None
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

- The bioplastic has been poured in a plate and then the bubble-wrap was added. It can be possible to put the bubble-wrap on the basis and pour the material directly on it

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Bioplastics Textures by Clara Davis https://clara-davis.com/albums/bioplasticstextures/*

recipe n.23




Composition

Water	*60 ml*
Gelatine powder	*12 g*
Glycerine	*7 g*
Crushed eggshells	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface. Add crushed eggshells and stir until they are homogeneously.
When the solution starts to boil and slightly thicken, pour it on the mould and leave it dry in a place with air flow.

General info

DATE
28/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
13%

THICKNESS
40%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 130 mm
THICKNESS	5 mm	3 mm
STRENGTH	High	High
FLEXIBILITY	Medium	None
ELASTICITY	Medium	None
WEIGHT	Medium	Medium
COLOUR	White and pink eggshells	White and pink eggshells
TRANSPARENCY	Low	Low
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Rough	Rough
ODOR	Medium	Low
STICKINESS	None	None
RUBBERINESS	Medium	None
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- The material is very resistant thanks to the eggshelles, but during the drying process it becomes concave

SUSTAINABLE TAGS

- RENAWABLE INGREDIENTS
- VEGAN INGREDIENTS
- WASTE COMPONENTS
- BIOCOMPOSTABLE INGREDIENTS
- RE-USE

REFERENCE: *Bioplastic Cook Book by Margaret Dunne https://issuu.com/nat_arc/docs/bioplastic_cook_book_3*

recipe n.24

Composition

Water	*250 ml*
Sodium alginate powder	*4 g*
Salt	*1.2 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
When the solution starts to boil and slightly thicken, pour it on the tray and leave it dry in a place with air flow.

General info

DATE
13/10/2021

PREPARATION TIME
30 minutes

PROCESSING TIME
2-7 days

MOULD
Silicone surface

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
5-10%

THICKNESS
95%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon
Sieve

Properties	Before drying	After drying
WIDTH/LENGTH	Uneven	Uneven
THICKNESS	2 mm	0.1 mm
STRENGTH	None	None
FLEXIBILITY	None	None
ELASTICITY	None	None
WEIGHT	Medium	Light
COLOUR	Whitish	Whitish
TRANSPARENCY	High	Low
GLOSSINESS	Smooth	Wrinkled
TEXTURE	Medium	Rough
ODOR	None	None
STICKINESS	None	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

- Once the material is completely dried, it shrinks a little and becomes very brittle and thin
- Curing process is very slow if the material is poured in a thick layer

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Alginate bioplastic by Materiom https://materiom.org/recipe/642*

recipe n.25

Composition

Water	*250 ml*
Sodium alginate powder	*4 g*
Salt	*1.2 g*
Safflower colorant powder	*2 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
When the solution starts to boil and slightly thicken, pour it on the tray and leave it dry in a place with air flow.

General info

DATE
13/10/2021

PREPARATION TIME
30 minutes

PROCESSING TIME
2-7 days

MOULD
Silicone surface

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
5-10%

THICKNESS
94%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon
Sieve

Properties	Before drying	After drying
WIDTH/LENGTH	Uneven	Uneven
THICKNESS	1.8 mm	0.1 mm
STRENGTH	None	None
FLEXIBILITY	None	None
ELASTICITY	None	None
WEIGHT	Medium	Light
COLOUR	Green	Green
TRANSPARENCY	High	Low
GLOSSINESS	Smooth	Wrinkled
TEXTURE	Medium	Rough
ODOR	None	None
STICKINESS	None	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

- Once the material is completely dried, it shrinks a little and becomes very brittle and thin
- Curing process is very slow if the material is poured in a thick layer

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Alginate bioplastic by Materiom https://materiom.org/recipe/642*

recipe n.26




Composition

Water	*200 ml*
Sodium alginate powder	*4 g*
Glycerine	*10 g*
White vinegar	*15 ml*
Coffee grounds	*10 g*

Preparation

Prepare a 2% alginate solution by mixing water with alginate and leave it to hydrate for 24 hours. Then, dry and sieve the coffee grounds to have a consistent material.
Mix the coffee grounds with 40 grams of the hydrated 2% alginate solution and glycerine. Stir the ingrendients and pour in a mould, leaving it for 15 minutes to set. Add on top the vinegar to coagulate the mix. Leave it for 15 minutes and then slightly separate the mix from the mould, leaving the vinegar into the sides. Leave it to dry for 1 -2 days.

ALGINATE-BASED

General info

DATE
29/10/2021

PREPARATION TIME
24 hours + 3 hours

PROCESSING TIME
7-10 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
27%

THICKNESS
40%

Tools

Scale
Bowls
Mould
Spatula
Spoon
Sieve
Brush

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 110 mm
THICKNESS	3 mm	1.8 mm
STRENGTH	Low	Low
FLEXIBILITY	Low	Low
ELASTICITY	None	Low
WEIGHT	Medium	Light
COLOUR	Dark brown	Dark brown
TRANSPARENCY	None	None
GLOSSINESS	HIgh	None
TEXTURE	Smooth and grainy	Cracked and grainy
ODOR	Medium	Low
STICKINESS	None	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

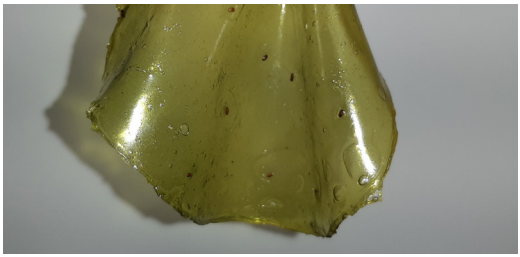
- The material is very delicate and easy to distort or break
- 40 grams of hydrated 2% alginate solution have been used for this recipe
- The surface starts to crack while drying

SUSTAINABLE TAGS

- RENAWABLE INGREDIENTS
- VEGAN INGREDIENTS
- WASTE COMPONENTS
- BIOCOMPOSTABLE INGREDIENTS
- RE-USE

REFERENCE: *Coffee Composite Co02 by Materiom https://materiom.org/recipe/171*

recipe n.27



Composition

Water	*200 ml*
Sodium alginate powder	*4 g*
Glycerine	*10 g*
White vinegar	*20 ml*
Safflower colorant powder	*q.s.*
Lavender seeds	*q.s.*

Preparation

Prepare a 2% alginate solution by mixing water with alginate and leave it to hydrate for 24 hours.
Mix 75 grams of the hydrated 2% alginate solution with seeds, colorant and glycerine. Stir the ingrendients and pour in a mould, leaving it for 15 minutes to set.
Add on top the vinegar to coagulate the mix. Leave it for 15 minutes and then slightly separate the mix from the mould, leaving the vinegar into the sides. Leave it to dry for 1 -2 days.

ALGINATE-BASED

General info

DATE
29/10/2021

PREPARATION TIME
24 hours + 48 hours

PROCESSING TIME
9-12 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
20%

THICKNESS
64%

Tools

Scale
Bowls
Mould
Spatula
Spoon
Sieve
Brush

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 120 mm
THICKNESS	5 mm	1.8 mm
STRENGTH	None	Low
FLEXIBILITY	None	High
ELASTICITY	None	Medium
WEIGHT	Medium	Light
COLOUR	Green	Green
TRANSPARENCY	High	High
GLOSSINESS	High	High
TEXTURE	Smooth	Smooth
ODOR	Medium	None
STICKINESS	High	High
RUBBERINESS	Low	Low
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

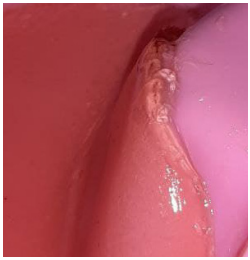
- Curing process is very slow if the material is poured in a thick layer
- 75 grams of hydrated 2% alginate solution have been used for this recipe

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Coffee Composite Co02 by Materiom https://materiom.org/recipe/171*

recipe n.28




Composition

Water	*200 ml*
Sodium alginate powder	*4 g*
Glycerine	*10 g*
White vinegar	*20 ml*
Radish colorant powder	*q.s.*

Preparation

Prepare a 2% alginate solution by mixing water with alginate and leave it to hydrate for 24 hours.
Mix 50 grams of the hydrated 2% alginate solution with colorant and glycerine. Stir the ingrendients and pour in a mould, leaving it for 15 minutes to set.
Add on top the vinegar to coagulate the mix. Leave it for 15 minutes and then slightly separate the mix from the mould, leaving the vinegar into the sides. Leave it to dry for 1 -2 days.

ALGINATE-BASED

General info

DATE
29/10/2021

PREPARATION TIME
24 hours + 48 hours

PROCESSING TIME
9-12 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
13%

THICKNESS
55%

Tools

Scale
Bowls
Mould
Spatula
Spoon
Sieve
Brush

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 130 mm (Uneven)
THICKNESS	4 mm	1.8 mm
STRENGTH	None	Low
FLEXIBILITY	None	High
ELASTICITY	None	Medium
WEIGHT	Medium	Light
COLOUR	Pink	Pink
TRANSPARENCY	High	High
GLOSSINESS	High	High
TEXTURE	Smooth	Smooth
ODOR	Medium	None
STICKINESS	High	High
RUBBERINESS	Low	Low
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- Curing process is very slow if the material is poured in a thick layer
- 50 grams of hydrated 2% alginate solution have been used for this recipe

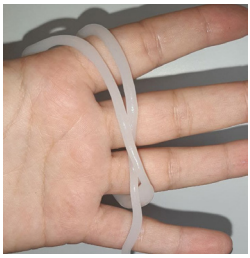
SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Coffee Composite Co02 by Materiom https://materiom.org/recipe/171*

recipe n.29






Composition

Water	*200 ml*
Sodium alginate powder	*6 g*
Glycerine	*10 g*
Sunflower oil	*5 g*
Water (chloride solution)	*300 ml*
Calcium chloride powder	*30 g*

Preparation

Create an homogenous paste by blending oil, alginate and glycerine and adding water slowly to avoid lumps. Leave the mixture overnight. Create the calcium chloride solution in a bottle by dissolving 30 g in hot water. After night, fill the syringe with alginate plastic and extrude it continuously and uninterruptedly into a jar of calcium chloride bath. Leave the string in the solution for a few minutes and then stretch them around a jar to create a spool. Spray some extra calcium chloride to close the leaks and let it cure until totally dry.

ALGINATE-BASED

General info

DATE
05/11/2021

PREPARATION TIME
20 minutes + 24 hours

PROCESSING TIME
2-7 days

MOULD
None

PHYSICAL FORM
Different shapes/Yarn

Shrinkage

WIDTH/LENGTH
20%

THICKNESS
80%

Tools

Scale
Bowls
Jars
Spatula
Spoon
Blender
Syringe
Brush
Bottle

Properties	Before drying	After drying
WIDTH/LENGTH	250 mm	200 mm
THICKNESS	Ø 6 mm (Uneven)	Ø 1.8 mm (Uneven)
STRENGTH	High	Medium
FLEXIBILITY	High	Medium
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	White	Yellowish
TRANSPARENCY	None	None
GLOSSINESS	High	Matte
TEXTURE	Smooth	Slighly rough
ODOR	None	None
STICKINESS	None	None
RUBBERINESS	HIgh	None
WATER REPELLENCY	High	High
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

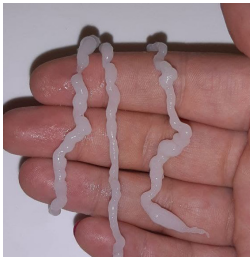
- Different shapes have been extruded in order to understand their strength (strings, grid and small bits
- The pressure used to extrude the strings was not uniform, causing an uneven shape

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/alginatestring/*

recipe n.30

Composition

Water	*200 ml*
Sodium alginate powder	*6 g*
Glycerine	*10 g*
Sunflower oil	*5 g*
Water (chloride solution)	*300 ml*
Calcium chloride powder	*30 g*

Preparation

Create an homogenous paste by blending oil, alginate and glycerine and adding water slowly to avoid lumps. Leave the mixture overnight. Create the calcium chloride solution in a bottle by dissolving 30 g in hot water. After night, fill the syringe with alginate plastic and extrude it continuously and uninterruptedly into a jar of calcium chloride bath. Leave the string in the solution for a few minutes and then stretch them around a jar to create a spool. Spray some extra calcium chloride to close the leaks and let it cure until totally dry.

General info

DATE
06/11/2021

PREPARATION TIME
20 minutes + 48 hours

PROCESSING TIME
2-7 days

MOULD
None

PHYSICAL FORM
Yarn

Shrinkage

WIDTH/LENGTH
9%

THICKNESS
50%

Tools

Scale
Bowls
Jars
Spatula
Spoon
Blender
Syringe
Brush
Bottle

Properties	Before drying	After drying
WIDTH/LENGTH	680 mm	340 mm
THICKNESS	Ø 2.5 mm (Uneven)	Ø 1.8 mm (Uneven)
STRENGTH	Low	Low
FLEXIBILITY	High	Medium
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	White	Yellowish
TRANSPARENCY	None	None
GLOSSINESS	High	Matte
TEXTURE	Slighly rough	Rough
ODOR	None	None
STICKINESS	None	None
RUBBERINESS	HIgh	None
WATER REPELLENCY	High	High
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

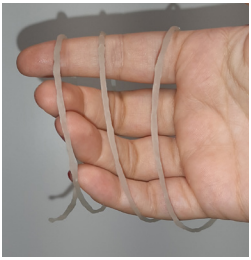
- The alginate plastic was left to rest for 2 nights becoming lumpsy and doughy, thus the extruded strings are very uneven
- 70 grams of hydrated alginate plastic have been used for this recipe

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/alginatestring/*

recipe n.31

Composition

Water	*200 ml*
Sodium alginate powder	*6 g*
Glycerine	*10 g*
Sunflower oil	*5 g*
Water (chloride solution)	*300 ml*
Calcium chloride powder	*30 g*

Preparation

Create an homogenous paste by blending oil, alginate and glycerine and adding water slowly to avoid lumps. Leave the mixture overnight. Create the calcium chloride solution in a bottle by dissolving 30 g in hot water. After night, fill the syringe with alginate plastic and extrude it continuously and uninterruptedly into a jar of calcium chloride bath. Leave the string in the solution for a few minutes and then stretch them around a jar to create a spool. Spray some extra calcium chloride to close the leaks and let it cure until totally dry.

General info

DATE
06/11/2021

PREPARATION TIME
20 minutes + 48 hours

PROCESSING TIME
2-7 days

MOULD
None

PHYSICAL FORM
Yarn

Shrinkage

WIDTH/LENGTH
50%

THICKNESS
28%

Tools

Scale
Bowls
Jars
Spatula
Spoon
Blender
Syringe
Brush
Bottle

ALGINATE-BASED

Properties	Before drying	After drying
WIDTH/LENGTH	900 mm	820 mm
THICKNESS	Ø 6 mm	Ø 3 mm
STRENGTH	High	Medium
FLEXIBILITY	High	Medium
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	White	Yellowish
TRANSPARENCY	None	None
GLOSSINESS	High	Matte
TEXTURE	Smooth	Slightly rough
ODOR	None	None
STICKINESS	None	None
RUBBERINESS	HIgh	None
WATER REPELLENCY	High	High
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

- The alginate plastic was left to rest for 2 nights becoming lumpsy and doughy, thus the extruded strings are very uneven
- 30 grams of hydrated alginate plastic have been used for this recipe

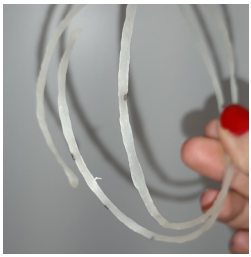
SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/alginatestring/*

recipe n.32






Composition

Water	*200 ml*
Sodium alginate powder	*6 g*
Glycerine	*10 g*
Sunflower oil	*5 g*
Water (chloride solution)	*300 ml*
Calcium chloride powder	*30 g*
Lavender seeds	*q.s.*

Preparation

Create an homogenous paste by blending oil, alginate and glycerine and adding water slowly to avoid lumps. Leave the mixture overnight. Create the calcium chloride solution in a bottle by dissolving 30 g in hot water. After night, fill the syringe with alginate plastic and seeds. Extrude the paste into calcium chloride bath and leave the strings in it for a few minutes. Wrap them around a jar to create a spool. Spray some extra calcium chloride to close the leaks and let it cure until totally dry.

General info

DATE
06/11/2021

PREPARATION TIME
20 minutes + 48 hours

PROCESSING TIME
2-7 days

MOULD
None

PHYSICAL FORM
Yarn

Shrinkage

WIDTH/LENGTH
15%

THICKNESS
53%

Tools

Scale
Bowls
Jars
Spatula
Spoon
Blender
Syringe
Brush
Bottle

Properties	Before drying	After drying
WIDTH/LENGTH	700 mm	590 mm
THICKNESS	Ø 6 mm	Ø 2.8 mm
STRENGTH	High	Medium
FLEXIBILITY	High	Medium
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	White & black seeds	Yellowish & black seeds
TRANSPARENCY	None	None
GLOSSINESS	High	Matte
TEXTURE	Smooth	Slightly rough
ODOR	None	None
STICKINESS	None	None
RUBBERINESS	HIgh	None
WATER REPELLENCY	High	High
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

- The alginate plastic was left to rest for 2 nights becoming lumpsy and doughy, thus the extruded strings are very uneven
- 30 grams of hydrated alginate plastic have been used for this recipe

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/alginatestring/*

recipe n.33




Composition

Water	*200 ml*
Sodium alginate powder	*6 g*
Glycerine	*10 g*
Sunflower oil	*5 g*
Water (chloride solution)	*300 ml*
Calcium chloride powder	*30 g*
Lavender seeds	*q.s.*

Preparation

Create an homogenous paste by blending oil, alginate and glycerine and adding water slowly to avoid lumps. Leave the mixture overnight. Create the calcium chloride solution in a bottle by dissolving 30 g in hot water. After night, mix some alginate plastic with seeds and them put a small quantity in the calcium chloride bath. Then, spray or brush some extra calcium chloride to close the leaks and let it cure until totally dry.

General info

DATE
06/11/2021

PREPARATION TIME
20 minutes + 48 hours

PROCESSING TIME
7-11 days

MOULD
Aluminum mould

PHYSICAL FORM
Solid

Shrinkage

WIDTH/LENGTH
40%

THICKNESS
25%

Tools

Scale
Bowls
Mould
Spatula
Spoon
Blender
Syringe
Brush
Bottle

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 55 mm	Ø 35 mm
THICKNESS	20 mm	15 mm
STRENGTH	Low	Low
FLEXIBILITY	Low	None
ELASTICITY	Low	None
WEIGHT	Medium	Light
COLOUR	White & black seeds	Brownish & black seeds
TRANSPARENCY	None	None
GLOSSINESS	High	Matte
TEXTURE	Smooth	Grainy
ODOR	None	None
STICKINESS	None	None
RUBBERINESS	HIgh	None
WATER REPELLENCY	High	High
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

- The alginate plastic was left to rest for 2 nights becoming lumpsy and doughy, thus the extruded strings are very uneven
- 70 grams of hydrated alginate plastic have been used for this recipe

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/alginatestring/*

recipe n.34




Composition

Water	*200 ml*
Sodium alginate powder	*6 g*
Glycerine	*10 g*
Sunflower oil	*5 g*
Water (chloride solution)	*300 ml*
Calcium chloride powder	*30 g*

Preparation

Create an homogenous paste by blending oil, alginate and glycerine and adding water slowly to avoid lumps. Leave the mixture overnight. Create the calcium chloride solution in a bottle by dissolving 30 g in hot water. After night, fill the syringe with alginate plastic and extrude it continuously and uninterruptedly into a jar of calcium chloride bath. Leave the string in the solution for a few minutes and then stretch them around a jar to create a spool. Spray some extra calcium chloride to close the leaks and let it cure until totally dry.

General info

DATE
07/11/2021

PREPARATION TIME
20 minutes + 24 hours

PROCESSING TIME
2-14 days

MOULD
None

PHYSICAL FORM
Yarn

Shrinkage

WIDTH/LENGTH
27%

THICKNESS
44%

Tools

Scale
Bowls
Jars
Spatula
Spoon
Blender
Syringe
Brush
Bottle

Properties	Before drying	After drying
WIDTH/LENGTH	520 mm	380 mm
THICKNESS	Ø 7.5 mm	Ø 4.2 mm
STRENGTH	High	Medium
FLEXIBILITY	High	Low
ELASTICITY	High	Medium
WEIGHT	Medium	Light
COLOUR	White	Yellowish
TRANSPARENCY	None	None
GLOSSINESS	High	Matte
TEXTURE	Smooth	Slightly rough
ODOR	None	None
STICKINESS	None	None
RUBBERINESS	HIgh	None
WATER REPELLENCY	High	High
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

- 70 grams of hydrated alginate plastic have been used for this recipe
- The knitting test of the bio-yarns was carried out 24 hours after their extrusion

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/alginatestring/*

recipe n.35




Composition

Water	*200 ml*
Sodium alginate powder	*6 g*
Glycerine	*10 g*
Sunflower oil	*5 g*
Water (chloride solution)	*300 ml*
Calcium chloride powder	*30 g*

Preparation

Create an homogenous paste by blending oil, alginate and glycerine and adding water slowly to avoid lumps. Leave the mixture overnight. Create the calcium chloride solution in a bottle by dissolving 30 g in hot water. After night, put 100 g of alginate plastic in the calcium chloride bath.
Then, spray or brush some extra calcium chloride to close the leaks and let it cure until totally dry.

General info

DATE
07/11/2021

PREPARATION TIME
20 minutes + 24 hours

PROCESSING TIME
2-14 days

MOULD
Round plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
50%

THICKNESS
70%

Tools

Scale
Bowls
Mould
Spatula
Spoon
Blender
Syringe
Brush
Bottle

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 120 mm	Ø 60 mm
THICKNESS	10-6 mm (Uneven)	3-1.8 mm (Uneven)
STRENGTH	High	High
FLEXIBILITY	High	Low
ELASTICITY	Medium	None
WEIGHT	Medium	Light
COLOUR	White	Yellowish
TRANSPARENCY	None	None
GLOSSINESS	High	Matte
TEXTURE	Smooth	Smooth and waved
ODOR	None	None
STICKINESS	None	None
RUBBERINESS	HIgh	None
WATER REPELLENCY	High	High
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

- 100 grams of hydrated alginate plastic have been used for this recipe

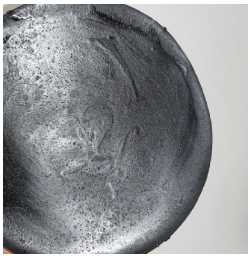
SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipes by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/alginatestring/*

recipe n.36






Composition

Water	*75 ml*
Gelatine powder	*12.5 g*
Activated charcoal powder	*7.5 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it inside a mould and leave it dry in a place with air flow.

General info

DATE
14/10/2021

PREPARATION TIME
25 minutes

PROCESSING TIME
2-5 days

MOULD
Round silicone mould

PHYSICAL FORM
Solid

Shrinkage

WIDTH/LENGTH
22%

THICKNESS
70%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 117 mm
THICKNESS	4 mm	1.2 mm
STRENGTH	High	Medium
FLEXIBILITY	High	None
ELASTICITY	Medium	None
WEIGHT	Medium	Light
COLOUR	Black	Black
TRANSPARENCY	None	None
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth and bubblish	Smooth and bubblish
ODOR	Low	None
STICKINESS	None	None
RUBBERINESS	Low	None
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

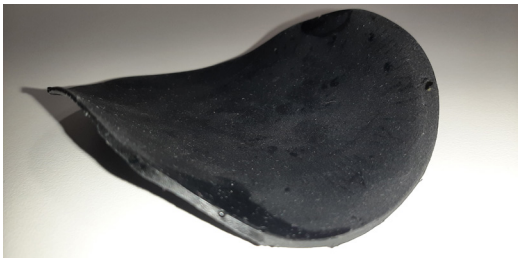
- Once the material is completely dried, it shrinks a lot
- One side is bubblish and more glossy and the other is matte

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Biofilter bioplastic activated charcoal by Fabtextiles and Clara Davis http://fabtextiles.org/bio-filter-bioplastic-activated-charcoal/*

recipe n.37



Composition

Water	*75 ml*
Gelatine powder	*12.5 g*
Activated charcoal powder	*7.5 g*
Glycerine	*12.5 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it inside a mould and leave it dry in a place with air flow.

General info

DATE
14/10/2021

PREPARATION TIME
25 minutes

PROCESSING TIME
2-5 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
21%

THICKNESS
56%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 118 mm
THICKNESS	5 mm	2.2 mm
STRENGTH	High	Medium
FLEXIBILITY	High	Medium
ELASTICITY	High	Medium
WEIGHT	Medium	Light
COLOUR	Black	Black
TRANSPARENCY	None	None
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth and bubblish	Smooth and bubblish
ODOR	Low	None
STICKINESS	None	None
RUBBERINESS	Low	Low
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

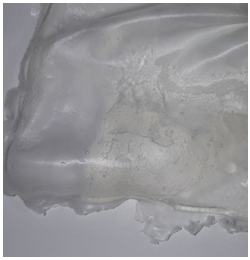
- Once the material is completely dried, it shrinks a lot
- One side is bubblish and more glossy and the other is matte

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Biofilter bioplastic activated charcoal by Fabtextiles and Clara Davis http://fabtextiles.org/bio-filter-bioplastic-activated-charcoal/*

recipe n.38




Composition

Water	*100 ml*
Potato starch powder	*7.5 g*
Glycerine	*12.5 g*
White vinegar	*15 ml*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a plate and leave it dry in a place with air flow.

General info

DATE
13/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
3-7 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
8%

THICKNESS
50%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	120 mm x 120 mm
THICKNESS	2 mm	1 mm
STRENGTH	None	Low
FLEXIBILITY	High	High
ELASTICITY	Low	High
WEIGHT	Medium	Light
COLOUR	Whitish	Uncoloured
TRANSPARENCY	Medium	High
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth and bubblish	Smooth and bubblish
ODOR	High	Medium
STICKINESS	High	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- Drying process is very slow if the material is poured in a thick layer

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Starch-based Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/starch.html*

recipe n.39

Composition

Water	*100 ml*
Potato starch powder	*7.5 g*
Glycerine	*12.5 g*
White vinegar	*15 ml*
Radish colorant powder	*q.s.*
Lemon colorant powder	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a plate and leave it dry in a place with air flow.

General info

DATE
13/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
3-7 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
8%

THICKNESS
50%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	120 mm x 120 mm
THICKNESS	2 mm	1 mm
STRENGTH	None	Low
FLEXIBILITY	High	High
ELASTICITY	Low	High
WEIGHT	Medium	Light
COLOUR	Pale orange	Orange-amber
TRANSPARENCY	Medium	High
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth and bubblish	Smooth and bubblish
ODOR	High	Medium
STICKINESS	High	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- Drying process is very slow if the material is poured in a thick layer

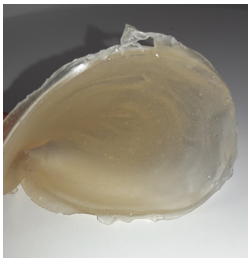
SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Starch-based Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/starch.html*

recipe n.40






Composition

Water	*100 ml*
Gelatine powder	*7.5 g*
Potato starch powder	*12.5 g*
Glycerine	*50 g*
White vinegar	*7.5 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it in a mould and leave it dry in a place with air flow.

General info

DATE
14/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
13%

THICKNESS
42%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 130 mm
THICKNESS	6 mm	3.5 mm
STRENGTH	High	High
FLEXIBILITY	High	High
ELASTICITY	High	High
WEIGHT	Medium	Light
COLOUR	White-yellow	Yellowish
TRANSPARENCY	Medium	Medium
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth	Smooth
ODOR	High	Medium
STICKINESS	High	None
RUBBERINESS	High	High
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- Once dried, the material shrinks and becomes yellowish
- The smell is strong and permanent

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Biorubber Recipe by Loes Bogers https://class.textile-academy.org/2020/loes.bogers/files/recipes/biorubber/*

recipe n.41

Composition

Water	*100 ml*
Potato starch powder	*7.5 g*
Glycerine	*12.5 g*
White vinegar	*15 ml*
Dried leaves	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
Place some dried leaves on the mould surface.
When the solution starts to boil and slightly thicken, pour it on the mould and leave it dry in a place with air flow.

General info

DATE
29/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
2-6 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
20%

THICKNESS
66%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 120 mm (Uneven)
THICKNESS	3 mm	1 mm
STRENGTH	None	Low
FLEXIBILITY	High	High
ELASTICITY	Low	High
WEIGHT	Medium	Light
COLOUR	Whitish + red leaves	Uncoloured + red leaves
TRANSPARENCY	Medium	High
GLOSSINESS	Medium	Medium
TEXTURE	Smooth and rough	Smooth and rough
ODOR	High	Medium
STICKINESS	High	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- Drying process is very slow if the material is poured in a thick layer

SUSTAINABLE TAGS

- RENAWABLE INGREDIENTS
- VEGAN INGREDIENTS
- WASTE COMPONENTS
- BIOCOMPOSTABLE INGREDIENTS
- RE-USE

REFERENCE: *Starch-based Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/starch.html*

recipe n.42

Composition

Water	*100 ml*
Potato starch powder	*7.5 g*
Glycerine	*12.5 g*
White vinegar	*15 ml*
Jersey textile scrap	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
During the cooking process, place a piece of jersey scrap on the plate. When the solution starts to boil and slightly thicken, pour it on the mould and leave it dry in a place with air flow.

General info

DATE
29/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
2-6 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
0%

THICKNESS
66%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon
Jersey scrap

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	130 mm x 130 mm
THICKNESS	3 mm + 0.8 mm	1 mm + 0.8 mm
STRENGTH	Low	Low
FLEXIBILITY	High	High
ELASTICITY	Low	High
WEIGHT	Medium	Light
COLOUR	Uncoloured + Burgundy	Uncoloured + Burgundy
TRANSPARENCY	None	None
GLOSSINESS	Matte	Matte
TEXTURE	Smooth and mesh	Smooth and mesh
ODOR	High	Medium
STICKINESS	High	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

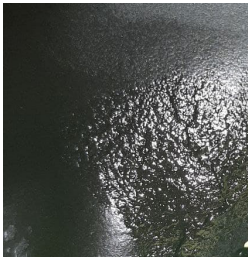
- The material could be poured on the textile scrap to make it more rough
- The smell is strong and permanent

SUSTAINABLE TAGS

- ✗ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✓ WASTE COMPONENTS
- ✗ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Starch-based Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/starch.html*

recipe n.43



Composition

Water	*100 ml*
Potato starch powder	*7.5 g*
Glycerine	*12.5 g*
White vinegar	*15 ml*
Activated charcoal powder	*7.5 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it in a plate and leave it dry in a place with air flow.

General info

DATE
29/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
2-6 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
7%

THICKNESS
80%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	120 mm x 120 mm (Uneven)
THICKNESS	4 mm	0.8 mm
STRENGTH	None	None
FLEXIBILITY	High	High
ELASTICITY	Low	High
WEIGHT	Medium	Light
COLOUR	Black	Black
TRANSPARENCY	None	None
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth	Smooth
ODOR	High	Medium
STICKINESS	High	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

- The material shrinks a lot during its drying process

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Starch-based Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/starch.html*

recipe n.44




Composition

Water	*100 ml*
Potato starch powder	*7.5 g*
Glycerine	*12.5 g*
White vinegar	*15 ml*
Activated charcoal powder	*7.5 g*
Cotton fabric scrap	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
During the cooking process, place a piece of cotton fabric scrap on the plate.
When the solution starts to boil and slightly thicken, pour it on the fabric and leave it dry in a place with air flow.

General info

DATE
29/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
2-6 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
0%

THICKNESS
66%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon
Cotton scrap

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	130 mm x 130 mm
THICKNESS	3 mm + 0.8 mm	1 mm + 0.8 mm
STRENGTH	Low	Low
FLEXIBILITY	High	High
ELASTICITY	Low	Medium
WEIGHT	Medium	Light
COLOUR	Black	Black
TRANSPARENCY	None	None
GLOSSINESS	Glossy	Matte
TEXTURE	Smooth and woven	Smooth and woven
ODOR	High	Medium
STICKINESS	High	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

- The material could be poured on the textile scrap to make it more rough
- The smell is strong and permanent

SUSTAINABLE TAGS

- RENAWABLE INGREDIENTS
- VEGAN INGREDIENTS
- WASTE COMPONENTS
- BIOCOMPOSTABLE INGREDIENTS
- RE-USE

REFERENCE: *Starch-based Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/starch.html*

recipe n.45




Composition

Water	*100 ml*
Corn starch powder	*7.5 g*
Glycerine	*12.5 g*
White vinegar	*15 ml*
Dried rose buds	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, add rose buds and pour it on the mould and leave it dry in a place with air flow.

General info

DATE
05/11/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
21%

THICKNESS
48%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 118 mm
THICKNESS	4 mm	3-0.8 mm (Uneven)
STRENGTH	Low	Low
FLEXIBILITY	Low	High
ELASTICITY	None	High
WEIGHT	Medium	Light
COLOUR	Whitish + roses	Uncoloured + roses
TRANSPARENCY	Low	High
GLOSSINESS	Medium	High
TEXTURE	Rough	Rough
ODOR	High	Medium
STICKINESS	High	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- Drying process is very slow as the material was poured in a thick layer and the sides started to crack
- The scent of dried roses helps to cover up the strong smell of vinegar

SUSTAINABLE TAGS

- RENAWABLE INGREDIENTS
- VEGAN INGREDIENTS
- WASTE COMPONENTS
- BIOCOMPOSTABLE INGREDIENTS
- RE-USE

REFERENCE: *Starch-based Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/starch.html*

recipe n.46

Composition

Water	*100 ml*
Corn starch powder	*7.5 g*
Glycerine	*12.5 g*
White vinegar	*15 ml*
Activated charcoal powder	*7.5 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it in a mould and leave it dry in a place with air flow.

General info

DATE
05/11/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
13%

THICKNESS
50%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 130 mm (Uneven)
THICKNESS	4 mm	2 mm (Uneven)
STRENGTH	High	Low
FLEXIBILITY	High	Medium
ELASTICITY	None	None
WEIGHT	Medium	Light
COLOUR	Black	Black
TRANSPARENCY	None	None
GLOSSINESS	Glossy/Matte	Glossy/Matte
TEXTURE	Smooth	Smooth
ODOR	High	Medium
STICKINESS	High	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Cool	Cool

NOTES & IMPROVEMENTS

- The surface cracked a lot during its drying process, despite the margins have been separated from the mould

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Starch-based Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/starch.html*

recipe n.47

Composition

Water	*100 ml*
Corn starch powder	*7.5 g*
Glycerine	*12.5 g*
White vinegar	*15 ml*
Activated charcoal powder	*7.5*
Cotton fabric scrap	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
During the cooking process, place a piece of cotton fabric scrap on the plate.
When the solution starts to boil and slightly thicken, pour it on the fabric and leave it dry in a place with air flow.

General info

DATE
05/11/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
5-8 days

MOULD
Square plastic plate

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
0%

THICKNESS
55%

Tools

Stove
Scale
Bowls
Pot
Plate
Spatula
Spoon
Cotton scrap

Properties	Before drying	After drying
WIDTH/LENGTH	130 mm x 130 mm	130 mm x 130 mm (Uneven)
THICKNESS	4 mm + 0.8 mm	1.8 mm + 0.8 mm (Uneven)
STRENGTH	Low	High
FLEXIBILITY	High	Low
ELASTICITY	High	None
WEIGHT	Medium	Light
COLOUR	Black	Black
TRANSPARENCY	None	None
GLOSSINESS	Glossy	Matte
TEXTURE	Smooth and woven	Smooth and woven
ODOR	High	Medium
STICKINESS	High	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Medium	Medium

NOTES & IMPROVEMENTS

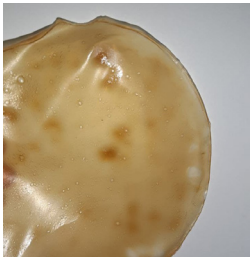
- The material could be poured on the textile scrap to make it more rough
- The smell is strong and permanent
- The material shrinks a lot during its drying process

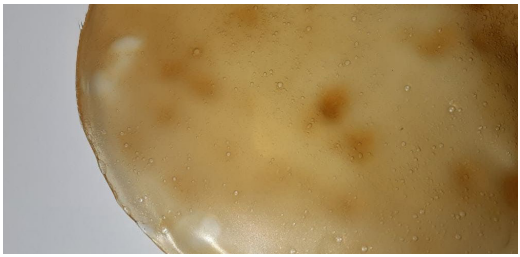
SUSTAINABLE TAGS

- RENAWABLE INGREDIENTS
- VEGAN INGREDIENTS
- WASTE COMPONENTS
- BIOCOMPOSTABLE INGREDIENTS
- RE-USE

REFERENCE: *Starch-based Cookbook by Tiare Ribeaux http://bioplastic-cookbook.schloss-post.com/starch.html*

recipe n.48





Composition

Water	*120 ml*
Pectin powder	*6 g*
Glycerine	*2.5 g*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a mould and leave it dry in a place with air flow.

General info

DATE
27/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
2-6 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
7%

THICKNESS
80%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 140 mm
THICKNESS	4 mm	0.8 mm
STRENGTH	Low	Low
FLEXIBILITY	Low	None
ELASTICITY	Low	None
WEIGHT	Light	Light
COLOUR	Uncoloured	Orange-amber
TRANSPARENCY	Medium	Medium
GLOSSINESS	Medium	Glossy/Matte
TEXTURE	Smooth and lumpsy	Smooth and lumpsy
ODOR	None	None
STICKINESS	High	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

- Lumps are easy to form during preparation

SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipe 4 Bioplastics n.05 by Stefano Parisi*

recipe n.49

Composition

Water	*60 ml*
Pectin powder	*6 g*
Glycerine	*2.5 g*
Radish colorant powder	*q.s.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a mould and leave it dry in a place with air flow.

General info

DATE
27/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
2-6 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
7%

THICKNESS
73%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 140 mm
THICKNESS	3 mm	0.8 mm
STRENGTH	Low	Low
FLEXIBILITY	Low	None
ELASTICITY	Low	None
WEIGHT	Light	Light
COLOUR	Pink	Pink
TRANSPARENCY	Medium	Medium
GLOSSINESS	Medium	Glossy/Matte
TEXTURE	Smooth	Smooth
ODOR	None	None
STICKINESS	High	None
RUBBERINESS	None	None
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

- The material shricks a lot during its drying process

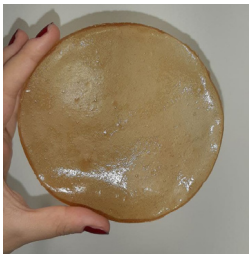
SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipe 4 Bioplastics n.05 by Stefano Parisi*

recipe n.50



Composition

Water	*60 ml*
Pectin powder	*6 g*
Glycerine	*2.5 g*
Sugar	*25 g.*

Preparation

Weight and mix the ingredients together in a pot until they are fully dissolved.
Heat the solution while stirring gently.
Remove bubbles on the top with a spoon to obtain an even surface.
When the solution starts to boil and slightly thicken, pour it on a mould and leave it dry in a place with air flow.

General info

DATE
27/10/2021

PREPARATION TIME
20 minutes

PROCESSING TIME
2-6 days

MOULD
Round silicone mould

PHYSICAL FORM
Sheet

Shrinkage

WIDTH/LENGTH
10%

THICKNESS
38%

Tools

Stove
Scale
Bowls
Pot
Mould
Spatula
Spoon

Properties	Before drying	After drying
WIDTH/LENGTH	Ø 150 mm	Ø 135 mm
THICKNESS	4 mm	2.5 mm
STRENGTH	Low	Medium
FLEXIBILITY	High	None
ELASTICITY	High	None
WEIGHT	Medium	Light
COLOUR	Yellow-amber	Yellow-amber
TRANSPARENCY	Low	Low
GLOSSINESS	Medium	Glossy/Matte
TEXTURE	Smooth	Smooth
ODOR	None	None
STICKINESS	High	Low
RUBBERINESS	Low	None
WATER REPELLENCY	None	None
TEMPERATURE	Slightly cool	Slightly cool

NOTES & IMPROVEMENTS

- The sugar makes the material a little sticky

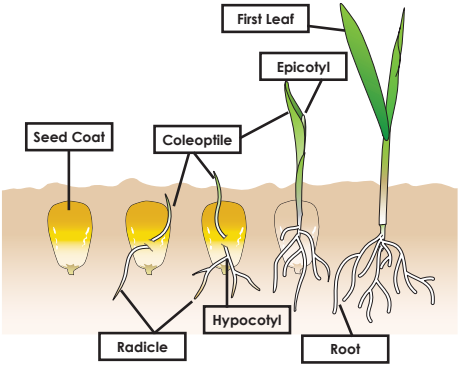
SUSTAINABLE TAGS

- ✓ RENAWABLE INGREDIENTS
- ✓ VEGAN INGREDIENTS
- ✗ WASTE COMPONENTS
- ✓ BIOCOMPOSTABLE INGREDIENTS
- ✓ RE-USE

REFERENCE: *Recipe 4 Bioplastics n.05 by Stefano Parisi*

parte

GROWING MATERIALS



Parts of an Emerging Corn Plant, **K-STATE,KSU CROPS,KANSAS CORN**, 09/2017

REFERENCE: *Anatomy of Flowering Plants*
The Seed by Toppr
https://www.toppr.com/guides/biology/anatomy-of-flowering-plants/the-seed/

Parts of a Seed and Their Functions by ScienceFacts.net
https://www.sciencefacts.net/parts-of-a-seed.html

What is the Difference Between Cotyledons and True Leaves by Pediaa.com
https://pediaa.com/what-is-the-difference-between-cotyledons-and-true-leaves/

seeds structure.

seed coat

It is the outer part of the seed, composed of an hard, thick and protective cover of the embryonic plant.

cotyledons

They are the embryonic leaves, known also as seed leaves.

radicle

It is the primary root of the plant, that usually blooms out of the seed coat during germination.

hypocotyl

It is the embryonic stem that pushes the cotyledons to the surface.

seminal roots

They are all the secondary roots that push the way out of the seed. Their function is to provide external nutrients.

epicotyl

It is the tiny shoot of an embryo that gives rise to the stem and leaves

coleoptile

It is the covering region and protective sheath of the epicotyl.

true or primary leaf

It is first foliage leaf of the flowering plants. They are thinner and softer than cotyledons.

Klara Kulikova - Unsplash

lavender.

General info

BOTANICAL NAME:	*Lavanda officinalis, Lavandula angustifolia*
GERMINATION:	*15-20 days*
LIFE CYCLE:	*Perennial*
PLANTING PERIOD:	*April - may*
HARVEST PERIOD:	*June - september*
WATERING FREQUENCY:	*1-2 times/week*
SUITABLE FOR POTS:	*Yes*
SEEDS SHAPE:	*Oval*
SEEDS COLOR:	*Black*
SEEDS DIMENSIONS:	*LENGTH: 2 mm THICKNESS: 1.5-2 mm*
LIGHT REQUIREMENT:	*Full sun*
TEMPERATURE REQUIREMENT:	*10-30 °C*
HUMIDITY REQUIREMENT:	*Not specified*
DISTANCE REQUIREMENT:	*SPACING: 30 cm DEPTH: 30 mm*
USE:	*Fragrance, ornamental, medicinal purposes*

trial n.1

Date

09/11/2021

Tools

Cotton pads
Lavender seeds
Water
Plate or container
Plastic wrap or lid

Preparation

Place some cotton pads on a plate

Soak the cotton pads with water to make them damp

Take one lavender seed at time and place it on a cotton pad

Go on and place max 3 or 4 seeds per each cotton pad

Cover the plate and leave it in an appropriate space

LAVENDER SEEDS

Lifecycle

DAY 0-1
DORMANCY

09/11-10/11/2021

Lavender seeds are in a dormancy phase.

DAY 2-3
OPENING SEEDS

11/11-12/11/2021

White-orange shaded radicles grow from lavender's seeds coat.

DAY 4-5
GROWTH

13/11-14/11/2021

Translucent white hypocotyl bloom out of the cotton pads and push the seeds upwards.

DAY 6
GROWTH

15/11/2021

White-orange radicles are intertwined in the cotton pads. Hypocotyls' length is about 2-3 cm. The small cotyledons are more visibile and green.

16/11/2021

DAY 7
GROWTH

Hypocotyls get longer and waved. Some radicles are visible above the cotton pads.

17/11/2021

DAY 8
TRANSPLANT

Coleoptiles are long 4-6 cm and are ready to be transplanted in cups with damp cotton wool.

18/11-22/11/2021

DAY 9-13
GROWTH

Lavender coleoptiles become longer. The black seeds coats fall off and first foliage leaves turn greener.

23/11-24/11/2021

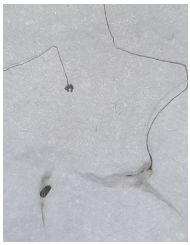
DAY 14-15
GROWTH

Coleoptiles are long around 6 cm. The primary leaves are completely open.

25/11/2021

DAY 16
DORMANCY

Lavender coleoptiles die for lack of watering. Their roots become orange and withered.



LAVENDER SEEDS

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 16 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

Lavender seeds died for improper watering and hot temperature in the room

NEED TO CONTROL BETTER THE SETTING

PERSONAL COMMENTS

Lavender seeds needs a lot of care and maintenance.
Different trials have been made putting the seeds inside and on the top of the cotton pads and, unfortunately, some of the lavender seeds never bloomed out.

REFERENCE: *LAVENDER SEEDS. Lavandula angustifolia facts by EdenBrothers*

Oscar Tintori

lemon.

General info

BOTANICAL NAME:	*Citrus trifuliata*
GERMINATION:	*7-9 days*
LIFE CYCLE:	*Perennial*
PLANTING PERIOD:	*February - june*
HARVEST PERIOD:	*July - December*
WATERING FREQUENCY:	*1 time/day in summer, 1 time/week in winter*
SUITABLE FOR POTS:	*Yes*
SEEDS SHAPE:	*Drop-like*
SEEDS COLOR:	*White/yellowish*
SEEDS DIMENSIONS:	*LENGTH: 6-8 mm THICKNESS: 5-6 mm*
LIGHT REQUIREMENT:	*Full sun*
TEMPERATURE REQUIREMENT:	*20-30 °C*
HUMIDITY REQUIREMENT:	*Not specified*
DISTANCE REQUIREMENT:	*SPACING: n/s DEPTH: n/s*
USE:	*Fragrance, culinary, medicinal purposes*

trial n.2

Date

05/11/2021

Tools

Lemon
Water
Hydrogen Peroxide
Paper Towel
Plate & Containers
Knife Sealed Bag

Preparation

Cut the lemon in half, squeeze it and remove the seeds under the pulp

Place the seeds on a quarter of paper towel, leaving some space between them

Fold the paper towel in four

Imbibit the paper towel with a dash of hydrogen peroxide

Imbibit the paper towel with a dash of water

Let the paper towel soak and put it in a sealed bag, labelling it with the date

LEMON SEEDS

Lifecycle

DAY 0-20 05/11-25/11/2021
DORMANCY

Lemon seeds are still in dormancy. Their activation process is made by mixing hydrogen peroxide and water. The back of the seeds has a dark shade. The coat is still covered by a jell-like veil.

DAY 21-24 26/11-29/11/2021
TRANSPLANT

The lemon seeds seem to be in dormancy. As a second trial, they have been transplanted in another substrate, cotton wool.

DAY 25 30/11/2021
OPENING SEEDS

One of the seed's coat is opening, therefore it has been moved in another paper cup.

DAY 26-39 01/12-14/12/2021
OPENING SEEDS

The hatched lemon seed creates a larger opening to allow the green and white root to spring up.
The seed's coat becomes fragile and brownish.

15/12-24/12/2021

DAY 40-50
GROWTH

The white tip is now long about 4-5 mm. The seed inside the coat becomes greener.

25/12/2021-
12/01/2022

DAY 51-70
GROWTH

The seed grows and the epicotyl reaches a length of 10 cm. The radicle is about 2-3 cm.

13/01-15/01/2022

DAY 71-73
WITHERING

The seedling shows lack of proper nutriets and the radicle starts to wither.

16/01-18/01/2022

DAY 74-76
DEACTIVATION

The lemon stops its growth and slowly becomes darker. In few hours it is totally shrinken, fragile and dies.

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 76 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

Lemon seeds died for improper nutrients

PERSONAL COMMENTS

This growing experimentation was the longest one, but it was extremely satisfying to see the seed's coat opening and then growing so quickly.

REFERENCE: *How to grow lemon tree by MyGardenChannel on Youtube*


PetFamily

catnip.

General info

BOTANICAL NAME:	*Nepeta cataria*
GERMINATION:	*7-10 days*
LIFE CYCLE:	*Perennial*
PLANTING PERIOD:	*All seasons, best in spring*
HARVEST PERIOD:	*All seasons*
WATERING FREQUENCY:	*1-2 times/day*
SUITABLE FOR POTS:	*Yes*
SEEDS SHAPE:	*Oval*
SEEDS COLOR:	*Black*
SEEDS DIMENSIONS:	*LENGTH: 2-3 mm THICKNESS: 2 mm*
LIGHT REQUIREMENT:	*Full sun*
TEMPERATURE REQUIREMENT:	*10-30 °C*
HUMIDITY REQUIREMENT:	*Not specified*
DISTANCE REQUIREMENT:	*SPACING: 50 mm DEPTH: 30 mm*
USE:	*Cat medicine, flavor teas*

trial n.3

Date

04/11/2021

Tools

Catnip seeds
Water
Cotton Wool
Plate/Container
Plastic wrap/Lid

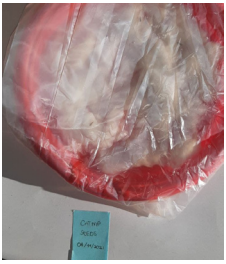
Preparation

Spread a layer of cotton wool over the bottom of a plate

Imbibit the cotton wool with water until it is evenly damp

Pull the cotton wool apart to break up the fibers and eventually remove extra water

Nestle the seeds into the top of the cotton wool leaving enough space between them



Cover the plate with plastic wrap , label it and place it in a proper location

CATNIP SEEDS

Lifecycle

DAY 0-2 04/11-06/11/2021
DORMANCY

Catnip seeds are activated by placing them on the cotton wool and soaking them with water.

DAY 3 07/11/2021
OPENING SEEDS

Seeds' coat start to open, allowing radicles to germinate above the cotton wool.

DAY 4-6 08/11-10/11/2021
GROWTH

White radicles grow inside the cotton wool and coleoptiles bloom out of the seeds' coat with a color gradient from dark red to white at the tip of the root

DAY 7 11/11/2021
TRANSPLANT

Primary leaves reach a length of 4,5-5 cm and are ready to be transplanted in paper cups.

12/11-25/11/2021

DAY 8-21
GROWTH

Catnip leaves are 6-8 cm long.
Some seeds are still in dormancy phase.

26/11-27/11/2021

DAY 22-23
GROWTH

The still-in-dormancy seeds start their growth process, opening and leaving the coleoptiles to grow.

28/11-29/11/2021

DAY 24-25
GROWTH

The green leaf is growing longer (around 9-10 cm). The small coleoptile on the left is showing its epicotyls. The other one is 2.5 cm long.

30/11/-04/12/2021

DAY 26-30
WILTING

One of the leaves is absolutely withered. The newer ones, on the other hand, grow green and strong.

05/12-06/12/2021

DAY 31-32
DEACTIVATION

The last two leaves are permanently withered due to the lack of nutrients and the improper temperature.

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 32 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

PERSONAL COMMENTS

Catnip was very easy to activate and grow but it would have been more interesting to sow more of them on the surface.

REFERENCE: *How to grow catnip by The Spuce*

trial n.4

Date

04/11/2021

Tools

Catnip seeds
Water
Cotton pads
Plate/Container
Plastic wrap/Lid

Preparation

Start putting the cotton pads over the bottom of a plate

Create a whole layer of cotton pads

Create a whole layer of cotton pads

Remove extra water and leave it soak for a bit

Nestle the seeds into the centre of the cotton pads

Cover the plate with plastic wrap, label it and place it in a proper location.

CATNIP SEEDS

Lifecycle

DAY 0-2 04/11-06/11/2021
DORMANCY

Catnip seeds are activated by placing them on cotton pads and soaking them with water.

DAY 3 07/11/2021
OPENING SEEDS

Seeds' coat start to open, allowing radicles to germinate above the cotton.

DAY 4-6 08/11-10/11/2021
GROWTH

White radicles grow above the cotton pads and coleoptiles bloom out of the seeds' coat with a color gradient from yellow to pink and white. They reach 1-3.5 cm.

DAY 7 11/11/2021
TRANSPLANT

Primary leaves reach a length of 4,5-5 cm and their radicles don't have enough cotton for interwine and search nutrients.

12/11-17/11/2021

DAY 8-13
GROWTH

Catnip leaves are 6-8 cm long.
Some seeds are still in dormancy phase.
Epicotyls become visible and have a length of 1 to 2 cm.

18/11-19/11/2021

DAY 14-15
GROWTH

Epicotyls grow slowly and take a intense green shade.

20/11-27/11/2021

DAY 16-23
GROWTH

Some green epicotyls keep growing.
Others grow but become shrunken and weak.

28/11-02/12/2021

DAY 24-28
WILTING

Catnip leaves appear weak but still alive, therefore they have been trimmed.

03/12/2021

DAY 29
DEACTIVATION

The last withered leaf is definetely dead.

CATNIP SEEDS

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 29 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

PERSONAL COMMENTS

Catnip was very easy to be activated and grow but it would have been more interesting to sow more of them on the surface.

REFERENCE: *How to grow catnip by The Spuce*

trial n.5

Date

04/11/2021

Tools

Catnip seeds
100 ml of water
1 g of Agar Powder
Pot
Spoon
Container With lid
Stove

Preparation

Prepare 1% agar solution by dissolving 1 g of agar powder in 100 ml of water

Cook over a medium heat and stir until the solution starts to boil and becomes viscose

Cool the solution slightly and pour into a container

Place the seeds equidistantly on the surface of the agar

The thickness of the substrate should be twice the thickness of the seeds

Cover the container with its lid and place it in an appropriate location

CATNIP SEEDS

Lifecycle

DAY 0-3 04/11-07/11/2021
DORMANCY

Catnip seeds are activated by placing them on the agar solution.

DAY 4 08/11/2021
OPENING SEEDS

Seeds' coat start to open, allowing radicles to bloom.

DAY 5 09/11/2021
GROWTH

White shaded radicles grow out of the seeds' coat with 4 mm of length
One small and shaded coleoptile starts to bloom vertically.

DAY 6-8 10/11-12/11/2021
GROWTH

One primary leaf sprouts and grows of 1 cm vertically. All the white roots penetrate
inside the solution and new coleoptiles start to sprout.

13/11/2021

DAY 9
GROWTH

The longest leaf is 3 cm long.
One of the two still-closed seeds shows white mold on its surface, that has been removed with a cutter

14/11-17/11/2021

DAY 10-13
GROWTH

Green epicotyls emerge from the coleoptiles, with a length of 6-7 mm.

18/11-23/11/2021

DAY 14-19
GROWTH

Catnip epicotyls keep growing.
Some orange spots and mold appear on the agar substrate and the seeds.
Mold has been removed from the top of the seeds.

24/11-28/11/2021

DAY 20-24
WILTING

Some radicles come off the agar substrate, thus some catnips epicotyls become deactivated. The agar composite shrinks and can be unmold from the container.

29/11-30/11/2021

DAY 25-26
DEACTIVATION

Agar is completely dry and shrinken.
Seedlings are totally withered.
New seeds are in search of nutrients and water. This could be the right moment to let the agar compost in the soil.

CATNIP SEEDS

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 26 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

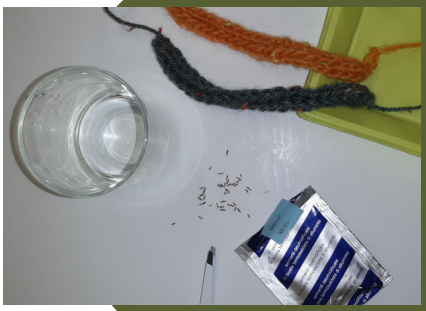
Agar is an interesting substrate for seeds. However when it becomes completely dried, seedlings must be already planted somewhere.

PERSONAL COMMENTS

This technique was new to me but very interesting to combine bioplastic concept with growing materials as seeds.

REFERENCE: *Agar Germination Method by Cropgenebank*

trial n.6



Date

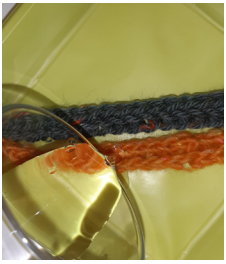
13/11/2021

Tools

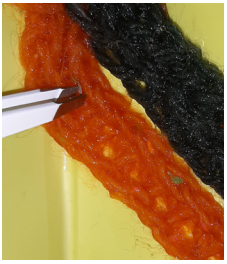
Catnip seeds
Water
Knit Wool Samples
Plate/Container
Plastic Wrap
Tweezers

Preparation

Place one or more wool samples lying flat on the plate



Soak them with enough water to make them moist



Take one seed at a time and place it in the damp wool with tweezers

Go ahead leaving 1-2 cm spacing between seeds until all the surface is covered

Use some plastic wrap to cover the seeds and place it in a proper space

CATNIP SEEDS

Lifecycle

DAY 0-3
DORMANCY

13/11-16/11/2021

Catnip seeds are activated by placing them on knitted wool.

DAY 4
OPENING SEEDS

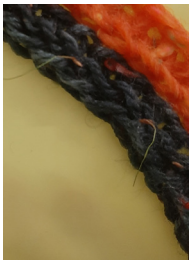
17/11/2021

Seeds' coat start to open, allowing radicles to bloom.

DAY 5-10
GROWTH

17/11-22/11/2021

White shaded radicles grow out of the seeds' coat. Coleoptiles sprout vertically and are long 0.5-4 cm. Their color gradient goes from white to pink.



DAY 11-12
GROWTH

23/11-24/11/2021

Some leaves are strong and vertical. Others show a undulating silhouette and become darker.

26/11-27/11/2021

DAY 13-14
GROWTH

Some of the withered catnips become stronger by watering them. One of the seedlings' epicotyl is now visible.
It is long 5 mm and its color grandient goes from white to light green.

28/11-29/11/2021

DAY15-16
GROWTH

The catnip seedlings keep growing and reach 4-5 cm of length.

30/11/-16/12/2021

DAY 17-34
WILTING

Catnip epicotyls keep growing.
Some orange spots and mold appear on the agar substrate and the seeds.
Mold has been removed from the top of the seeds.

17/12/-18/12/2021

DAY 35-36
DEACTIVATION

The last catnip is wilting and fall off on the wool surface. In few hours it dies.

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 36 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

Wool is perfect to let seeds grow. This test was a starting point for the thesis' project.

PERSONAL COMMENTS

The process of wilting was slow and not linear.
Knitting wool for this test was so soothful and stimulating.

REFERENCE: *Seeds in knitted wool by Lara Campos for her project beGrounded*


Pickels & Honey

chia.

General info

BOTANICAL NAME:	*Salvia hispanica*
GERMINATION:	*3-14 days*
LIFE CYCLE:	*Annual*
PLANTING PERIOD:	*All seasons, better spring*
HARVEST PERIOD:	*All seasons, better summer*
WATERING FREQUENCY:	*2-3 times/day*
SUITABLE FOR POTS:	*Yes*
SEEDS SHAPE:	*Oval*
SEEDS COLOR:	*Dark brown, grey, creamy*
SEEDS DIMENSIONS:	*LENGTH: 1-2 mm THICKNESS: 1.5-2 mm*
LIGHT REQUIREMENT:	*Full sun*
TEMPERATURE REQUIREMENT:	*15-20 °C*
HUMIDITY REQUIREMENT:	*Prefers dried soils*
DISTANCE REQUIREMENT:	*SPACING: 15-20 cm DEPTH: 6 mm*
USE:	*Culinary, medicinal purposes, ornamental*

trial n.7

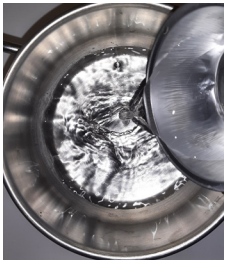
Date

13/11/2021

Tools

Hydrated chia seeds
100 ml of water
1 g of Agar Powder
Pot
Spoon
Container With lid
Stove

Preparation



Prepare 1% agar solution by dissolving 1 g of agar powder in the water

Cook over a medium heat and stir until the solution starts to boil and becomes viscose

Cool the solution slightly and pour into a container.

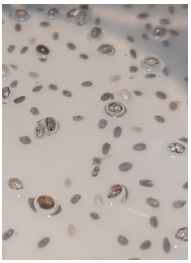
The thickness of the substrate should be twice the thickness of the seeds

Pour hydrated chia seeds on the substrate. Some may fall on the bottom.

Cover the container with its lid and place it in an appropriate location

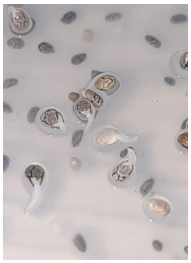
CHIA SEEDS

Lifecycle



DAY 0 13/11/2021
DORMANCY

Some chia seeds are on the bottom and others are sticked to the surfaced, depending on their density and the reaction with the agar solution.



DAY 1 14/11/2021
OPENING SEEDS

Some white small radicles start to bloom out of the coats.
Those seeds settled on the bottom of the container seem to be in dormancy.

DAY 2 15/11/2021
GROWTH

White radicles become longer (6-7 mm) and furry.
Small and green coleoptiles bloom out out of the tip of the radicles.

DAY 3-8 16/11-21/11/2021
GROWTH

Coleoptiles become white and longer (around 2-8 cm). At the tip of them some small and bright green foliages appear. Agar substrate has a sweet smell.
Seedlings are following the light and grow in the same direction.

23/11-24/11/2021

DAY 10-11
GROWTH

Coleoptiles are long about 8-9 cm and follows the direction of the sunlight, giving them an extremely inclined shape. The chia seeds at the bottom of the agar solution become darker and browner.

25/11/2021

DAY 12
GROWTH

Brown halos grow at the bottom of the agar substrate.
Chia primary leaves are completely open and have an intense green color.

26/11-28/11/2021

DAY 13-15
GROWTH

The radicles move inside the agar substrate to search for nutrients.
Mold spots become darker.
The agar sheet is dried enough to come off the mold. Its thickness is about 4 mm.

29/11/2021

DAY 16
WILTING

As the sheet shrinks and dries out, on its bottom the seeds with brown halos emerge, open and let long and white radicles bloom out of the coats.

30/11-01/12/2021

DAY 17-18
DEACTIVATION

Agar shrinks and dries up.
Seedlings are totally withered.
New seeds are in search of nutrients and water.
The dead sample is dark, strong and inflexible.

CHIA SEEDS

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 18 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

The seeds on the bottom, starting to grow when the material is shrinking, show the possibility to integrate them in bioplastics.

PERSONAL COMMENTS

The process was extremely stimulating and fascinating since the seeds on the bottom showed to be still alive and to support my thesis idea.

REFERENCE: *Agar Germination Method by Cropgenebank*

trial n.8

Date

13/11/2021

Tools

Hydrated chia seeds
Water
Knit Wool Samples
Plate/Container
Plastic Wrap
Tweezers

Preparation

Place the wool samples lying flat on the plate

Soak them with enough water to make them moist

Take some hydrated chia seeds and place them in the moist wool with tweezers

Go ahead, leaving some space between seeds until all the surface is covered

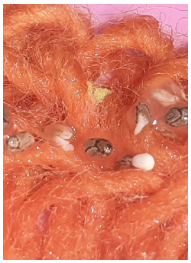
Use some plastic wrap to cover the seeds and place it in a proper space

CHIA SEEDS

Lifecycle

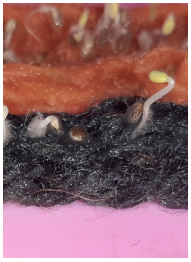
DAY 0 13/11/2021
DORMANCY

Chia seeds are activated by placing them inside the wool and their white halos become bigger.



DAY 1 14/11/2021
OPENING SEEDS

Seeds' coat start
to open, allowing white radicles to bloom.



DAY 2 15/11/2021
GROWTH

The small radicles grow out of the seeds' coat with 3-4 mm of length and become hairy.
Small and green coleoptiles bloom out of the tip of the radicles.

DAY 3-5 16/11-18/11/2021
GROWTH

Coleoptiles become white and longer (around 2 cm). Small and intese green foliages leaves appear. White and translucent radicles are growing beyond the samples.

19/11/-23/11/2021

DAY 6-10
GROWTH

The dicotyledons show the small pair of green primary leaves. Then, the primary leaves completely open and take on a darker green color.
The coleoptiles are long 8 cm and get tangled up by following the sunlight.

24/11-26/11/2021

DAY 11-13
GROWTH

The roots move in search of nutrients and are characterized by a white-orange gradient.
Some seedlings are entirely dried, becoming shrunken and withered.

27/11-29/11/2021

DAY 14-16
WILTING

Chia seedlings appear increasingly weak and fall off on the sides.
Those already dead and withered have reduced their diameter (that is about 0.1 mm), are very shriveled and dark.

30/11-05/12/2021

DAY 17-22
WILTING

The living leaves are strong and their coleoptiles are thicker. The roots of the dead seedlings are brownish at the bottom of the wool samples.

06/12-07/12/2021

DAY 23-24
DEACTIVATION

The last coleoptiles are weak and withered.
The wool sample is completely dry and shows thin and dark seedlings. On its back the radicles are wrinkled and brown.

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 24 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

This test on knitted wool worked better than that of catnip seeds.

PERSONAL COMMENTS

The process of wilting was slow. Knitting wool for this test was funny and stimulating.
The effect of chia seeds on wool was so lovely!

REFERENCE: *Seeds in knitted wool by Lara Campos for her project beGrounded*

trial n.9

Date

26/11/2021

Tools

Hydrated chia seeds
Water
2 Cotton Fabric Samples (10X10 cm)
Two Plates
Tweezers

Preparation

Cut two samples of cotton and place the first one on a plate to soak it with water

Place the second sample on the first one

Soak the samples with enough water

Place hydrated chia seeds, helping you with tweezers

Go onplacing the chia seeds until the surface is covered (around 20-25)

Cover the plate with another plate and place it in an appropriate location

CHIA SEEDS

Lifecycle

DAY 0 26/11/2021
DORMANCY

Chia seeds are activated by placing them on the cotton samples and their jelly halos become bigger.

DAY 1 27/11/2021
OPENING SEEDS

White small radicles bloom out of the coats to anchor the seedlings.

DAY 2 28/11/2021
GROWTH

White radicles become more long and curly, searching for nutrients.

DAY 3-4 29/11-30/11/2021
GROWTH

Coleoptiles grow a little. White and translucent radicles are growing on the samples.

01/12-02/12/2021

DAY 5-6
GROWTH

Few dicotyleons are growing, making visible embryonic leaves.
The radicles struggle to find stability and collect nutrients.
Some seeds are still in dormancy.

03/12-04/12/2021

DAY 7-8
WILTING

The seedlings are still growing but they are laying on the cotton fabric and looks darker. Some coleoptiles are almost dead and come off the surface easily.

05/12-07/12/2021

DAY 9-11
WILTING

The long seelings keep growing stronger.
Some of the seeds show small foliages opening inside the coat even though their radicles are very short.

08/12/2021

DAY 12
DEACTIVATION

The radicles cannot reach more nutrients without going under the fabric.
They rapidly shrink and die.

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 12 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

Comparing this growing test with test n.#12 of chia seeds on paper towel, it can be assumed that the cotton fabric make the process slower.

PERSONAL COMMENTS

Chia seeds struggled to be alive and it was hard to save them.

trial n.10

Date

26/11/2021

Tools

Hydrated chia seeds
Water
Wool felt sample (10X10 cm)
Two Plates
Tweezers

- Preparation

Cut the samples of wool felt and place the first it on a plate

Soak the sample with water until it is damp

Place hydrated chia seeds, helping you with tweezers

Go on placing the chia seeds until the surface is covered (around 20-25)

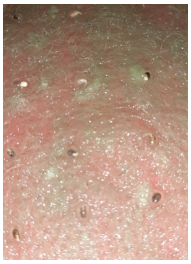
Cover the plate with another plate and place it in an appropriate location

CHIA SEEDS

Lifecycle

DAY 0 26/11/2021
DORMANCY

Chia seeds are activated by placing them on the woollen felt and their white halos become bigger.

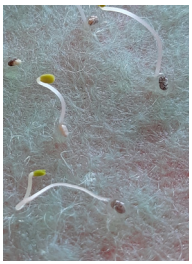


DAY 1 27/11/2021
OPENING SEEDS

White small radicles bloom out of the coats to anchor the seedlings into the wool. Some watering is needed.

DAY 2-3 28/11-29/11/2021
GROWTH

The radicles grow out of the seeds' coat with 1-2 cm of length, going inside the wool.
Coleoptiles bloom out and push upwards their pale green tips.



DAY 4 30/11/2021
GROWTH

Coleoptiles become white and longer (around 2 cm). Small and intese green foliages leaves appear. White and translucent
radicles are growing inside the wool sample.

01/12-02/12/2021

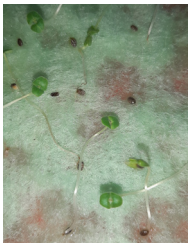
DAY 5-6
GROWTH

Coleoptiles follow the sunlight direction. The first two leaves are open and green. Some seeds are still in dormancy or opening.

03/12-05/12/2021

DAY 7-9
GROWTH

Chia seedlings are in lack of water because of the high indoor temperature. They fall off on the woollen surface but they are still alive.
The chia seedlings keep growing stronger and their leaves turn darker.



06/12-09/12/2021

DAY 10-13
WILTING

The foliage is growing stronger. Two of the seedlings are weak and withered, turning very thin and brown. Some seeds are just opening and blooming directly as primary leaves.

10/12-11/12/2021

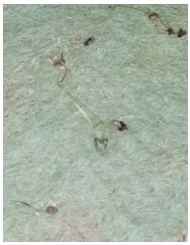
DAY 14-15
WILTING

Some of the coleoptiles become weak and fall off the woollen surface.
The seedlings need more watering and nutrients.

12/12-13/12/2021

DAY 16-17
DEACTIVATION

The felt dries up quickly and the seedlings fall off on the surface.
The next day the seedlings die definitively in need of nutrients besides water.



Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 17 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

Comparing this growing test with tests n.#9 and n.#12, it can be inferred that the wool fabric allows a slower process than paper towel but quicker than the cotton one.

PERSONAL COMMENTS

Chia seeds are the quickest seeds tested and they show to grow easily on wool surfaces. This is a good news for the fashion system!

REFERENCE: *Seeds in wool felt by Paula Ulargui Escalona*

trial n.11

Date

11/03/2021

Tools

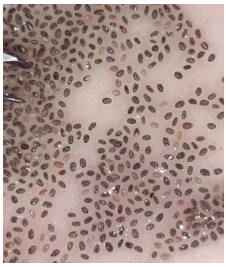
Hydrated chia seeds
Water
Wool felt sample (10X10 cm)
Two Plates
Tweezers

Preparation

Place the wool felt sample on a plate or container

Soak the sample with water until it is damp

Pour a good quantity of chia seeds on the surface with the help of tweezers



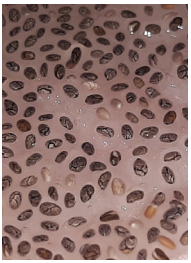
Cover the entire surface with chia seeds, using the tweezers

Make the seeds surface even in order to make them grow easily

Cover the plate with another plate and place it in an appropriate location

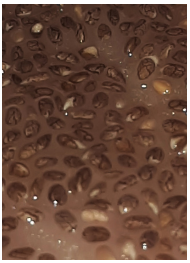
CHIA SEEDS

Lifecycle



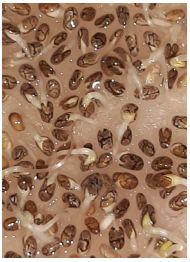
DAY 0 11/03/2022
DORMANCY

Chia seeds are activated by placing them on the woollen felt and their white halos become bigger.



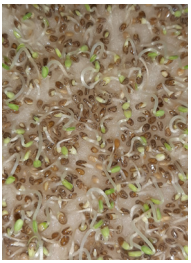
DAY 1 11/03/2022
OPENING SEEDS

White small radicles bloom out of the coats to anchor the seedlings.



DAY 2 12/03/2022
GROWTH

White radicles become longer (6-7 mm) and furry.



DAY 3 13/03/2022
GROWTH

The radicles grow out of the seeds' coat with 3-4 cm of length. They can't penetrate in the paper so they grow on the surface.
Coleoptiles bloom out and push upwards their pale green tips.

14/03-18/03/2022

DAY 4-7
GROWTH

Coleoptiles follow the sunlight direction.
The first two leaves are open and green.
Some seeds are still in dormancy or opening.

19/03-20/03/2022

DAY 8-9
GROWTH

Chia seedlings are in lack of water because of the high indoor temperature. They fall off on the woollen surface but they are still alive.
The chia seedlings keep growing stronger and their leaves turn darker.

21/03/-22/03/2022

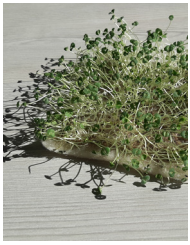
DAY 10-11
GROWTH

The foliage is growing stronger. Two of the seedlings are weak and withered, turning very thin and brown. Some seeds are just opening and blooming directly as primary leaves.

23/03/-26/03/2022

DAY 12-15
WILTING

Some of the coleoptiles become weak and fall off the woollen surface.
The seedlings need more watering and nutrients.



27/03/-28/03/2022

DAY 16-17
DEACTIVATION

The felt dries up quickly and the seedlings fall off on the surface.
The next day the seedlings die definitively in need of nutrients besides water.

CHIA SEEDS

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 17 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

This test showed the feasibility of combining wool felt with chia seeds. In particular, it is visible how the quantity of chia seeds can change the final effect of the sample,

PERSONAL COMMENTS

This sample is the one used to simulate the final prototype an undestand the timing. I love the contrast between green plants and white felt!

REFERENCE: *Seeds in wool felt by Paula Ulargui Escalona*

trial n.12

Date

26/11/2021

Tools

Hydrated chia seeds
Water
Paper towel
Two Plates
Tweezers

Preparation

Fold two veil of paper towel in fou

Place it on the centre of a plate

Soak the paper towel with some water

Place hydrated chia seeds, helping you with tweezers

Go on placing the chia seeds until the surface is covered (around 20-25)

Cover the plate with another plate and place it in an appropriate location

Lifecycle

DAY 0 26/11/2021
DORMANCY

Chia seeds are activated by placing them on the paper towel and their white halos become bigger.

DAY 1 27/11/2021
OPENING SEEDS

White small radicles bloom out of the coats to anchor the seedlings.

DAY 2 28/11/2021
GROWTH

White radicles become longer (6-7 mm) and furry.

DAY 3 29/11/2021
GROWTH

The radicles grow out of the seeds' coat with 3-4 cm of length. They can't penetrate in the paper so they grow on the surface.
Coleoptiles bloom out and push upwards their pale green tips.

30/11/2021

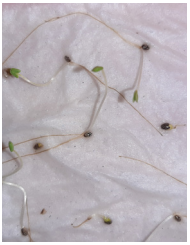
DAY 4
GROWTH

Coleoptiles become white and longer (around 4-5 cm). Small and intese green foliages leaves appear. White and translucent radicles are growing of 5-6 cm on the paper surface, in search of nutrients.

01/12/2021

DAY 5
GROWTH

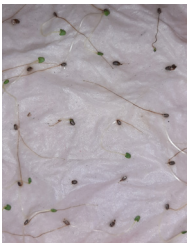
Radicles become brownish. The coleoptiles are translucent and at their tip small foliages are opening.



02/12-05/12/2021

DAY 6-9
WILTING

The paper towel dries quickly. The radicles turn brown, therefore the seedlings look slightly withered, but still alive.



06/12/2021

DAY 10
DEACTIVATION

The seedlings keep to dry out despite being watered day by day. This is to say that the nutrients are not enough against the high temperature of the indoor environment.

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 10 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

Comparing this growing test with tests n.#9 and n.#10, it is clear that paper towel could be an interesting substrate just for few hours.

PERSONAL COMMENTS

Chia seeds struggled to keep growing. The deactivation of seeds was expactable.

trial n.13

Date

30/11/2021

Tools

Hydrated Chia Seeds
Water
Cotton Tubular Yarn
Plate
Syringe
Thick Needle
Tweezers
Plastic Wrap

Preparation

Pick some hydrated chia seeds with the help of the tweezers

Make a hole (3 mm) inside the cotton yarn, piercing it with the tip of the needle

Put the chia seed inside the hole by helping you with the tweezers

Try to draw together and close the cotton threads to encapsulate the seed

Soak the yarn, expecially on the seeds' areas, by using a syringe

Cover the plate with some plastic wrap and place it in an appropriate location

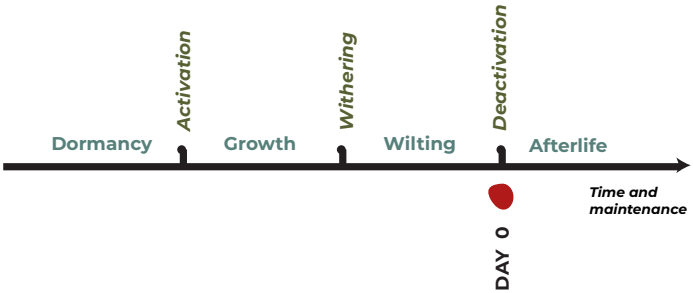
Lifecycle

DAY 0-X
DORMANCY

30/11-10/12/2021

Chia seeds are placed inside the cotton yarn, but the test went wrong.

Lifecycle diagram



NOTES & IMPROVEMENTS

The chia seeds are probably dead because of the pressure put on them during the process. Additionally, the yarn is very tight and difficult to make it wet.

NEED TO WORK MORE ON THIS

REFERENCE: *Seeds in cotton yarn by Svenja Keune for her project On Textile Working*

trial n.14

Date

10/12/2021

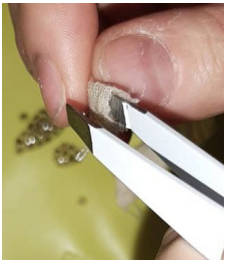
Tools

Hydrated Chia Seeds
Water
Cotton Tubular Band
Plate
Syringe
Wooden stick
Tweezers
Plastic Wrap

Preparation

Pick some hydrated chia seeds with the help of the tweezers

Put chia seeds inside the cotton band with the tip of the tweezers



Put some pressure on the seeds to fill the cotton tube

Use the wooden stick to push chia seeds easily and go on filling all the length of the cotton band

Use the wooden stick to push chia seeds easily and go on filling all the length of the cotton band

Cover the plate with another plate and place it in an appropriate location

Lifecycle

DAY 0 10/12/2021
DORMANCY

The chia seeds are activated inside the tubular cotton band.
They are damp and their dark color is visible under the fabric.

DAY 1 11/12/2021
OPENING SEEDS

The band is still damp and looks inflated because of the seeds halos.

DAY 2 12/12/2021
GROWTH

Some of the chia seeds are opening and the radicles bloom out. One of the seeds comes out the cotton band, making it more visible.

DAY 3 13/12/2021
GROWTH

The cotton fabric make it difficult to understand the stages of the seeds. Some of them seem to be still in activation while some others show small openings on their coats.

13/12/2021

DAY 3
GROWTH

The cotton fabric make it difficult to understand the stages of the seeds.
Some of them seem to be still in activation while some others show small openings on their coats.

14/12-15/12/2021

DAY 4-5
GROWTH

The chia seeds that are outsided the cotton band can grow easily.
Those that are inside do not have enough space to reach water and settle down.

16/12/2021

DAY 6
DEACTIVATION

The chia seeds seem to be deactivated since they do not show radicles.
For those seedlings outside the band there's need of water and they die quickly without a substrate.

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 6 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

The chia seeds are probably dead because the cotton fabric is not suitable for the growth.

NEED TO FIND NEW COTTON SOLUTIONS

PERSONAL COMMENTS

Even though the space was very neat, few chia seeds made it!

REFERENCE: *Seeds in cotton yarn by Svenja Keune for her project On Textile Working*

Marina Reich - Unsplash

sunflower.

General info

BOTANICAL NAME:	*Helianthus annuus*
GERMINATION:	*10-14 days*
LIFE CYCLE:	*Annual*
PLANTING PERIOD:	*March - june*
HARVEST PERIOD:	*June - september*
WATERING FREQUENCY:	*1 time/day*
SUITABLE FOR POTS:	*Yes*
SEEDS SHAPE:	*Drop-like*
SEEDS COLOR:	*Dark brown/gray wiht white stripes*
SEEDS DIMENSIONS:	*LENGTH: 6-7 mm THICKNESS: 2-3 mm*
LIGHT REQUIREMENT:	*Full sun*
TEMPERATURE REQUIREMENT:	*15-20 °C*
HUMIDITY REQUIREMENT:	*Prefers draining soils*
DISTANCE REQUIREMENT:	*SPACING: 20-30 cm DEPTH: 12 cm*
USE:	*Culinary, medicinal purposes, ornamental*

trial n.15

Date

03/12/2021

Tools

Hydrated sunflower seeds
100 ml of water
1 g of Agar Powder
Pot
Spoon
Container With lid
Stove

Preparation

Prepare 1% agar solution by dissolving 1 g of agar powder in the water

Cook over a medium heat and stir until the solution starts to boil and becomes viscose

Cool the solution slightly and pour into a container

Once the solution seems to be jelly, pour the seeds on the top of it

The thickness of the substrate should be twice the thickness of the seeds

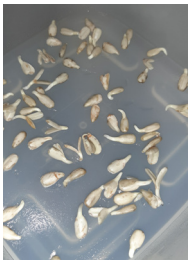
Cover the container with its lid and place it in an appropriate location

SUNFLOWER SEEDS

Lifecycle

DAY 0 03/12/2021
DORMANCY

Sunflower seeds are activated by placing them on the agar solution.



DAY 1 04/12/2021
OPENING SEEDS

The seeds tips elongate to become radicles. The seeds are still movable on the agar substrate. They look more white and big.

DAY 2 05/12/2021
GROWTH

The radicles are white and furry and about 5-10 mm. Since the seeds are movable, some starts to penetrate into the agar substrate in search of nutrients and water. The opened parts of the seeds turn pale green.

DAY 3 06/12/2021
GROWTH

The radicles grow with a length of 1-3 cm and are visibly different from the coleoptiles.
All the seedlings become intesely green and try to settle vertically.

07/12-09/12/2021

DAY 4-6
GROWTH

The green of the seedlings become intense and darker in some spots.
The roots turn into several radicles in search of nutrients and entagle with the others. Those sunflowers that are deep-rooted are growing vertically.

10/12/-11/12/2021

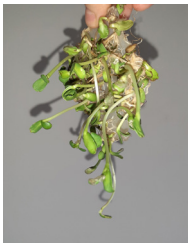
DAY 7-8
GROWTH

The sunflower seedlings grow stronger and greener. One of them reach the length of 8.5-9 cm.
Some radicles in the center of the agar substrate finally penetrate it and reach the bottom.

12/12/-13/12/2021

DAY 9-10
GROWTH

The agar is completely detachable from the container. This could be the right moment to transplant the substrate in a potting or garden soil.
The seedlings are growing and their radicles are extremely tangled up.



14/12/-18/12/2021

DAY 11-15
WILTING

The sunflower seedlings looks withered and in need of water. The agar substrate shrinks more and more, showing the radicles at its bottom.

19/12/2021

DAY 16
DEACTIVATION

The sunflower seedlings are withered. The agar substrate is totally shrinken and let the seedlings in lack of water.

SUNFLOWER SEEDS

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 16 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

The process showed once again the effectiveness of using agar as substrate for seeds.

PERSONAL COMMENTS

The process was satisfying to follow since the sunflower seedlings are bigger compared to the ones before.

REFERENCE: *Agar Germination Method by Cropgenebank*

trial n.16

Date

26/11/2021

Tools

Hydrated sunflower seeds
Water
Wool felt sample (10X10 cm)
Two Plates
Pen
Scissors

Preparation

Cut the samples of wool felt and place the first it on a plate

Soak the sample with water until it is damp

Place hydrated chia seeds, helping you with tweezers

Go on placing the sunflower seeds until the surface is covered (around 9-16)

Cover the plate with another plate and place it in an appropriate location

SUNFLOWER SEEDS

Lifecycle

DAY 0 03/12/2021
DORMANCY

Sunflower seeds are activated by placing them on the woollen surface. Some of them are already open.

DAY 1 04/12/2021
OPENING SEEDS

The seed tip begins to lengthen to become a radicle. The seeds are still movable on the felt surface.

DAY 2 05/12/2021
GROWTH

The radicles are white, furry and long 3-5 mm. Some begin to settle into the holes in the wool.

DAY 3 06/12/2021
GROWTH

The radicles grow with a length between 4 and 25 mm and become less furry. The coleoptiles are now visibile and can be distinguished from the radicles. All the seedlings take on a pale green shade.

07/12-08/12/2021

DAY 4-5
GROWTH

Two of the sunflower seedlings are growing stronger. Their radicles multiply to reach more water and nutrients.

09/12-10/12/2021

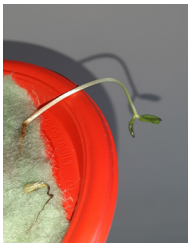
DAY 6-7
GROWTH

One of the last two sunflowers is weak and start to fall off on the sides.
The coleoptile of the other seedling takes a shade of pink and becomes longer. It is visible a transparent patina, that breaks off from the primary leaves.

11/12-15/12/2021

DAY 8-12
WILTING

The last sunflower is withering because of the lack of water. The radicles become brownish and the foliage fall off on the surface. The felt has been watered again and the seedling recovers and gets up, but it still looks weak.



16/12/2021

DAY 13
WILTING

The coleoptile is totally shrunken and withered.
It losts its strength and dies.

Lifecycle diagram

Other info

- TOTAL TIME OF MAINTENANCE: 13 days
- LIGHT: Indoor
- TEMPERATURE: Room temperature around 25-28 °C
- NUTRITION: None
- HUMIDITY: Through insing and draining

NOTES & IMPROVEMENTS

Wool felt is tightly woven, thus the growth of sunflower seeds is quite difficult since they are bigger than chia seeds.

PERSONAL COMMENTS

Sunflower seeds create a stronger aesthetical effect compared to the other ones.

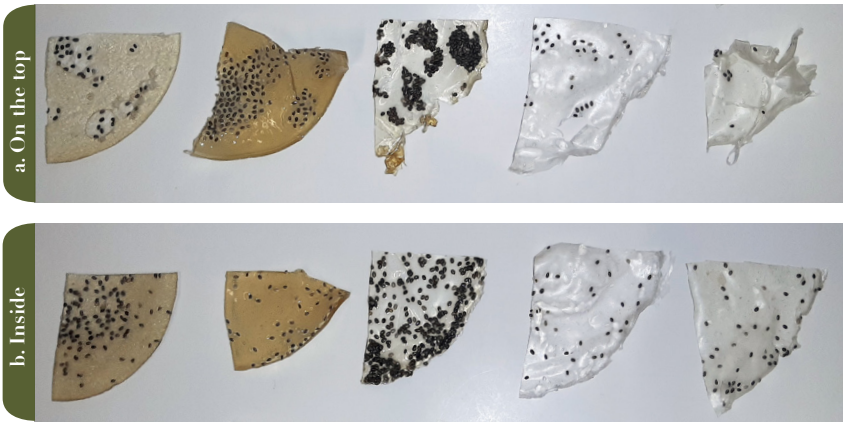
REFERENCE: *Seeds in wool felt by Paula Ulargui Escalona*

part 04

MATERIALS TESTINGS

TESTED BIOMATERIALS

AGAR GELATINE ALGINATE POTATO STARCH CORN STARCH



dissolution in hot water.

Testing tools

Selected biomaterials
Two glass bowls
Pot
Water
Other containers
if needed

THE EVALUTION IS BASED ON TWO PARAMETERS:

water resistance

The selection of materials will be tested to prove the waterproof property of them.

seeds endurance

The endurance of the seeds to boiling water will be considered to prove their resistance to unproper condition and their timing in biodegrading.

final look

Pictures and notes after being soaked for 24 hours and then dried

AGAR

#1A

12/12/2021

The sample shrinks a little and becomes more brittle, but it is still in good conditions.

46 HOURS

#1B

12/12/2021

The sample shrinks a little and becomes more brittle, but it is still in good conditions.

GELATINE

46 HOURS

#2A

12/12/2021

The sample shrinks a little but it is still in perfect conditions.

#2B

12/12/2021

The sample shrinks a little but it is still in perfect conditions.

ALGINATE

#3A

12/12/2021
The pieces shrink a little bit and become more brittle.

46 HOURS

#3B

12/12/2021
The alginate breaks in few pieces. They shrink and become brittle.

POTATO STARCH

48 HOURS

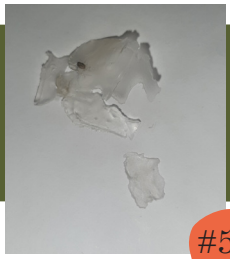
#4A

14/12/2021
The material is extremely brittle and thin and becomes yellowish.

#4B

14/12/2021
The small pieces shrink a lot and become slightly yellow. The material is very brittle.

CORN STARCH



#5A

14/12/2021
The material shrinks a lot and turn into small, thin and brittle pieces.

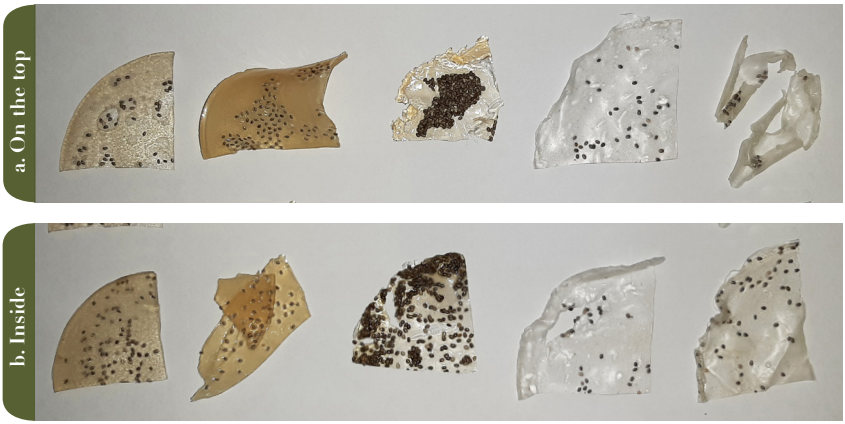
48 HOURS

#5B

14/12/2021
The material breaks in small pieces and shrinks a lot, becoming yellow.

TESTED BIOMATERIALS

AGAR GELATINE ALGINATE POTATO STARCH CORN STARCH



degradation in potting soil.

Testing tools

Selected biomaterials
Potting soil
Pots
Water
if needed

THE EVALUTION IS BASED ON TWO PARAMETERS:

compostability

This test will prove the eco-friendly nature of the biomaterials, following its compostability process.

decomposition time

The timing of decomposition will be traced in order to understand the difference of these innovative materials compared to the traditional ones.

selected biomaterials

Planting

agar gelatine alginate potato starch corn starch



02/01/2022
10:00 AM

Biomaterials have been planted in three pots full of potting soil, then water has been added.

Degradation

3 DAYS



05/01/2022
10:35 AM

Water make cornstarch samples whitish and thick.

7 DAYS



09/01/2022
09:50 AM

Different temperatures cause the shrinkage of materials.

14 DAYS

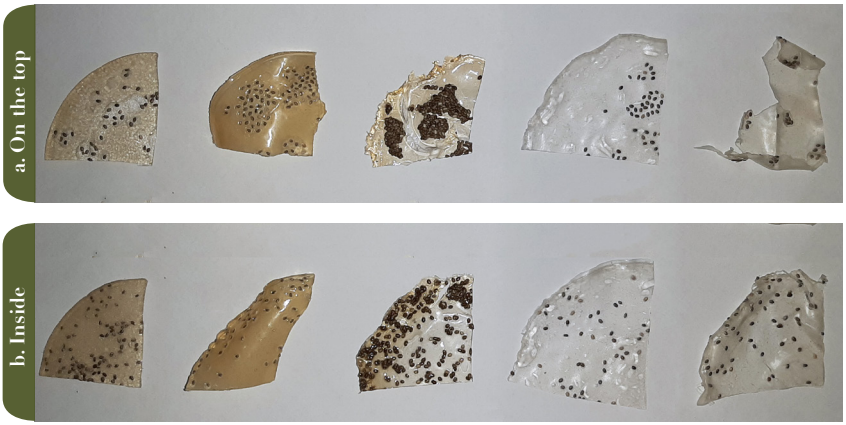


16/01/2022
12:25 PM

Materials are becoming fragile but the lack of microbes and nutrients in the soil.

TESTED BIOMATERIALS

AGAR GELATINE ALGINATE POTATO STARCH CORN STARCH



decomposition in garden soil.

Testing tools

Selected biomaterials
Garden soil
Pots *if needed*
Water *if needed*

THE EVALUTION IS BASED ON TWO PARAMETERS:

compostability

This test will prove the eco-friendly nature of the biomaterials, following its compostability process.

decomposition time

The timing of decomposition will be traced in order to understand the difference of these innovative materials compared to the traditional ones.

selected biomaterials

Planting

agar gelatine alginate potato starch corn starch

02/01/2022
10:00 AM

Biomaterials have been planted in a unique pots full of natural garden soil, then water has been added.

Decomposition

3 DAYS

05/01/2022
10:35 AM

Water make cornstarch samples whitish and thick.

7 DAYS

09/01/2022
09:50 AM

Starch-based materials are broken and disintegrated.

14 DAYS

16/01/2022
12:25 PM

Starch-based materials are almost decomposed.
Agar- and alginate-based are shrinken and fragile. Gelatin is still thick but less strong.

results.

hot water

GENERAL FINDINGS

- Seeds on the top of the materials come off before the ones inside them.
- Some seeds opened but hot water killed them.

AGAR	✓ waterproof	? seeds endurance
GELATINE	✗ waterproof	? seeds endurance
ALGINATE	✗ waterproof	? seeds endurance
POTATO STARCH	✗ waterproof	? seeds endurance
CORN STARCH	✗ waterproof	? seeds endurance

potting soil

GENERAL FINDINGS

- Decomposition is slow because potting mix is sterile.
- Seeds struggle to open their cot in low temperatures.

decomposition 40-60 DAYS

decomposition 40-80 DAYS

decomposition 40-50 DAYS

decomposition 30-40 DAYS

decomposition 30-40 DAYS

garden soil

GENERAL FINDINGS

- Decomposition is halved compared to the potting soil.
- Seeds struggle to open their cot in low temperatures.

decomposition 20-30 DAYS

decomposition 20-40 DAYS

decomposition 20-25 DAYS

decomposition 15-20 DAYS

decomposition 15-20 DAYS

NICLA GUARINO