सिपेट: पेट्रोकेमिकल्स तकनीकी संस्थान (आईपीटी)
रसायन एवं पेट्रोरसायन विभाग
रसायन एवं उर्वरक मंत्रालय, भारत सरकार
गिण्डी, चेन्नई - 600 032.
फोन : 91-44-2225 4701 (6 लाइन)
ई-मेल : chennai@cipet.gov.in
वेब्सइट : www.cipet.gov.in

सिपेट CIPET

CIPET: INSTITUTE OF PETROCHEMICALS TECHNOLOGY (IPT)
Department of Chemicals & Petrochemicals
Ministry of Chemicals & Fertilizers, Govt. of India
Guindy, Chennai - 600 032.
Phone : 91-44-2225 4701 (6 Lines)
E-mail : chennai@cipet.gov.in
Website : www.cipet.gov.in

ITUWTSA NEW DELHI 2024

संदर्भ/Ref: परीक्षण/TR/ 25081733 दिनांक/Date: 30-03-2026

प्रति /To,

YASH LAXMI ECO PACK PVT LTD.

Plot No.B25/33-126, Jawahar Nagar Extension, Behlupur, Varansi Uttar Pradesh - 221 010

विषय/Sub : Testing of samples-reg.

संदर्भ/Ref : Your letter no. --

Dated: 04-08-2025

महोदय,

कृपया हमारी परीक्षण रिपोर्ट क्रमांक प्राप्त करे। Please find enclosed herewith our Test Report no.	84049	दिनांक dated	30-03-2026

धन्यवाद,

भवदीय

अधिकृत हस्ताक्षरकर्ता

संलग्न : उपर्युक्तानुसार
Encl:1.a/a.

केंद्रीय पेट्रोरसायन अभियांत्रिकी एवं प्रौद्योगिकी संस्थान
पेट्रोकेमिकल्स तकनीकी संस्थान
रसायन एवं पेट्रोरसायन विभाग
रसायन एवं उर्वरक मंत्रालय, भारत सरकार
गिण्डी, चेन्नै - 600 032.
फोन : 91-44-2225 4701-6 फैक्स : 91-44-22254707
ई-मेल : chennai@cipet.gov.in वेब्साइट : www.cipet.gov.in

सिपेट CIPET

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY
INSTITUTE OF PETROCHEMICALS TECHNOLOGY
Department of Chemicals & Petrochemicals
Ministry of Chemicals & Fertilizers, Govt. of India
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E-mail : chennai@cipet.gov.in Website : www.cipet.gov.in

परीक्षण रिपोर्ट / TEST REPORT

को ज़ारी / Issued to :

YASH LAXMI ECO PACK PVT LTD.
Plot No.B25/33-126, Jawahar Nagar Extension, Behlupur,
Varansi Uttar Pradesh - 221 010

क्र.सं / Sl. No. **38501**

रिपोर्ट सं / REPORT NO. **84049**

दिनाक / Date : **30-03-2026**

Pages.....Nos. Part A,B,C & D

संदर्भ / Customer Let. Ref : --

04-08-2025

परीक्षण मानक स्तर के अनुसार परीक्षण रिपोर्ट / TEST REPORT AS PER TEST STANDARD : Refer Part C

भाग - क / PART - A

प्रस्तुत सैंपिल का विवरण / PARTICULARS OF SAMPLE SUBMITTED

अ)	सैंपिल का नाम / a) Name of the Sample	:	Biodegrdable Tabelware - Tray - as stated by party
आ)	सैंपिल प्राप्त होने की तारीख / b) Date of Receipt of sample	:	12-08-2025
इ)	ग्रेड/प्रकार/आकार/वर्ग / c) Grade / variety / type / size / class	:	Nil
ई)	घोषित मूल्य / d) Declared value, If any	:	Nil
उ)	कोड सं. / e) Code No.	:	Nil
ऊ)	बैच सं. एवं निर्माण तारीख / f) Batch No. and Date of Manufacture:		Nil
ऋ)	मात्रा / g) Quantity	:	2 kg
ए)	पेंकिंग की रीति / h) Mode of Packing	:	carton packing
ऐ)	मोहर बंद या नहीं / i) Sealed or not	:	Sealed
ओ)	कोई अन्य सूचना / j) Any other information	:	-

25081733

भाग - ख / PART - B

अनुपूरक सूचनाएँ / SUPPLEMENTARY INFORMATIONS

अ)	सैंपिलिंग कार्यवाहियों हेतु संदर्भ / a) Reference to sampling procedure	:	Sampling not done by this lab
आ)	माप करने हेतं लिए गए सहायक दस्तावेज एवं प्राप्त परिणाम b) Supporting documents for the measurement taken and result derived	:	As given in Part C
इ)	संबंधित कार्य अनुदेशों में निर्धारित के अनुसार परीक्षण रीति से कोई परिवर्तन c) Deviation from the test method as prescribed in relevant work instructions, if any	:	No deviation from the standard

केंद्रीय पेट्रोरसायन अभियांत्रिकी एवं प्रौद्योगिकी संस्थान
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सिपेट CIPET

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INSTITUTE OF PETROCHEMICALS TECHNOLOGY
Department of Chemicals & Petrochemicals
Ministry of Chemicals & Fertilizers, Govt. of India
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परीक्षण रिपोर्ट / TEST REPORT

रिपोर्ट सं / **REPORT NO. :84049**

क्र.सं / Sl. No. 38501

दिनाक / Date : **30-03-2026**

Test Duration : 28-08-2025 to 30-03-2026

भाग - ग / PART - C

परीक्षण परिणाम // TEST RESULTS

sl. No.	Name of the test	Test method / Standard	unit	Results Obtained	Specific Requirements
1	Material Identification	FTIR & DSC	-	Cellulose (Paper)	-
2	Disintegration (Dry mass remains in 2 mm sieve after 84 days)	ISO 17088:2021 Cl.no. 6.2	%	7.4	Not more than 10
3	Ultimate aerobic Biodegradation (with reference to 100% degradation of positive reference)	ISO 17088:2021 Cl.no. 6.3	%	90.4 (At the end of 138 days)	> 90 (At the end of the test period not more than 180 days.)
4	Plant growth test				
	Monocotyledon (Sorghum) % Seed emergence	OECD 208 Guidelines	%	94	> 90
	Dicotyledon (Cress) % Seed Emergence		%	93	> 90
5	Acute Ecotoxic effects to earthworm	ISO 11268-1 : 2012	%		
a	Survial of adult earthworm at the end of 7 days			100	Shall be more than 90
b	Survial of adult earthworm at the end of 14 days			98	Shall be more than 90
c	Biomass end of the 14 days			95	Shall be more than 90
6	Chronic ecotoxic effets to earthworm	ISO 11268-2 : 2023	%		
a	Survial of adult earthworm at the end of 28 days			96	Shall be more than 90
b	Survial of adult earthworm at the end of 56 days			96	Shall be more than 90
c	Offspring at the end of 56 days			97	Shall be more than 90
d	Biomass end of the 56 days			96	Shall be more than 90

The detailed observation on biodegradability test is enclosed as Annexure

AUTHORISED SIGNATORY
Dr. Radhashyam Giri
Technical Officer

AUTHORISED SIGNATORY
S. Udhayamalar,

रिपोर्ट सं / REPORT NO. : **84049** परीक्षण परिणाम / TEST RESULTS दिनाक /Date : **30-03-2026**

Issued to: YASH LAXMI ECO PACK PVT LTD., Plot No.B25/33-126, Jawahar Nagar Extension, Behlupur, Varansi Uttar Pradesh - 221 010

Customer Letter No. Nil, dtd. 04/08/2025

PART C - TEST RESULTS

Sl.No	Name of the Test	Test Method/ Standard	Unit	Results Obtained	Specified Requirements*
7	Heavy metals concentration				
a.	Arsenic (As)			Not Detected	10
b.	Copper (Cu)			0.04.3	300
c.	Nickel (Ni)			0.0655	50
d.	Zinc (Zn)	ISO		0.022	1000
e	Cobalt (Co)	17088:2021	mg/kg	Not Detected	-
f.	Chromium (Cr)			0.3552	50
g.	Molybdenum (Mo)			0.893	-
h.	Mercury (Hg)			Not Detected	0.15
i.	Cadmium (Cd)			0.0045	5
j.	Lead (Pb)			0.0784	100
k.	Selenium (Se)			0.1721	-

* Based on Municipal solid waste (Management and Handling) Rules, 2016 notified on 8th April, 2016 by Ministry of Environment , Forests and climate change, Government of India. Note that concentration of metals like cobalt, molybdenum, and selenium is not mentioned in the notification.

NIL

Note

1. This Test Report / Certificate is issued only for the samples submitted to the laboratory.
2. The results stated above related only to the items tested.
3. The quality of the subsequent production lot has to be ensured by the purchaser.
4. This Test Report shall not be reproduced except in full without the written approval of the laboratory.
5. Any anomaly/discrepancy in this report should be brought to the notice of the laboratory within 30 days from the date of issue.
6. Subcontracted Tests (if any): Nil

AUTHORISED SIGNATORY
Dr. Radhashyam Giri

AUTHORISED SIGNATORY
S. Udhayamalar,

रिपोर्ट सं / REPORT NO. : **84049** परीक्षण परिणाम / TEST RESULTS दिनाक /Date : **30-03-2026**

Issued to: YASH LAXMI ECO PACK PVT LTD., Plot No.B25/33-126, Jawahar Nagar Extension, Behlupur, Varansi Uttar Pradesh - 221 010

Customer Letter No. Nil, dtd. 04/08/2025

OBSERVATION FOR BIODEGRADABILITY TEST AS PER ISO 17088:2021

1 **Sample Details (As stated by Party):** Biodegradable Tableware - Tray

2 **Material Identification by FTIR :** Cellulose (Paper)

BIODEGRADABILITY TEST AS PER ISO:14855-1

3 **Observation**

(i) Conditions of reaction mixtures

Origin of Compost: Livestock excrement, municipal and vegetable waste

Reaction Temperature (°C)	:	58
Dry Solid (%)	:	53.42
Volatile content (%)	:	17.2
CO_2 evolved during first 10days in blank	:	50.64 mg/g
Test duration (days)	:	138 days
Reference material	:	Cellulose
Volume of reaction vessel (mL)	:	3000 ml

(ii) pH of test medium

S.No.	Compost Vessel	pH (Before)	pH (After)
1	Blank 1	7.34	7.32
2	Blank 2	7.35	7.33
3	Blank 3	7.31	7.28
4	Cellulose 1	7.19	7.16
5	Cellulose 2	7.23	7.21
6	Cellulose 3	7.21	7.18
7	Negative 1	7.16	7.15
8	Negative 2	7.12	7.1
9	Negative 3	7.14	7.12
10	Sample 1	7.11	7.08
11	Sample 2	7.13	7.1
12	Sample 3	7.17	7.16

Contd.,

AUTHORISED SIGNATORY
Dr. Radhashyam Giri
Technical Officer

AUTHORISED SIGNATORY
S. Udhayamalar,
Manager (Tech.)

रिपोर्ट सं / REPORT NO. : **84049**

परीक्षण परिणाम / TEST RESULTS

दिनाक /Date : **30-03-2026**

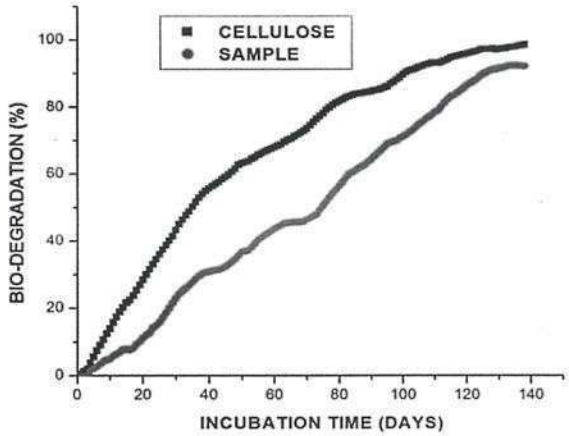
Issued to: YASH LAXMI ECO PACK PVT LTD., Plot No.B25/33-126, Jawahar Nagar Extension, Behlupur, Varansi Uttar Pradesh - 221 010

Customer Letter No. Nil, dtd. 04/08/2025

4 **Result:** Percentage biodegradation relative to positive reference

Sample (Mean) : 90.4 % at the end of 138 days

The reference Material - cellulose : ~ 100%



5 Visual **Observation of Sample**

Description	Week 1-4	Week 5-8	Week 9-12
Structure	Cut pieces	Cut pieces	Fragmented pieces
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	White	Dirty	Dirty
Fungal Development	Nil	Nil	Nil
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

Description	Week 13-16	Week 17-18	Week 19-20
Structure	Fragmented pieces	Fragmented pieces	Fragmented pieces
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	Dirty	Dirty	Dirty
Fungal Development	Nil	Nil	Nil
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

Contd.,

AUTHORISED SIGNATORY
Dr. Radhashyam Giri
Technical Officer

AUTHORISED SIGNATORY
S. Udhayamalar,
Manager (Tech.)

रिपोर्ट सं / REPORT NO. : **84049**

परीक्षण परिणाम / TEST RESULTS

दिनाक /Date : **30-03-2026**

Issued to: YASH LAXMI ECO PACK PVT LTD., Plot No.B25/33-126, Jawahar Nagar Extension, Behlupur, Varansi Uttar Pradesh - 221 010

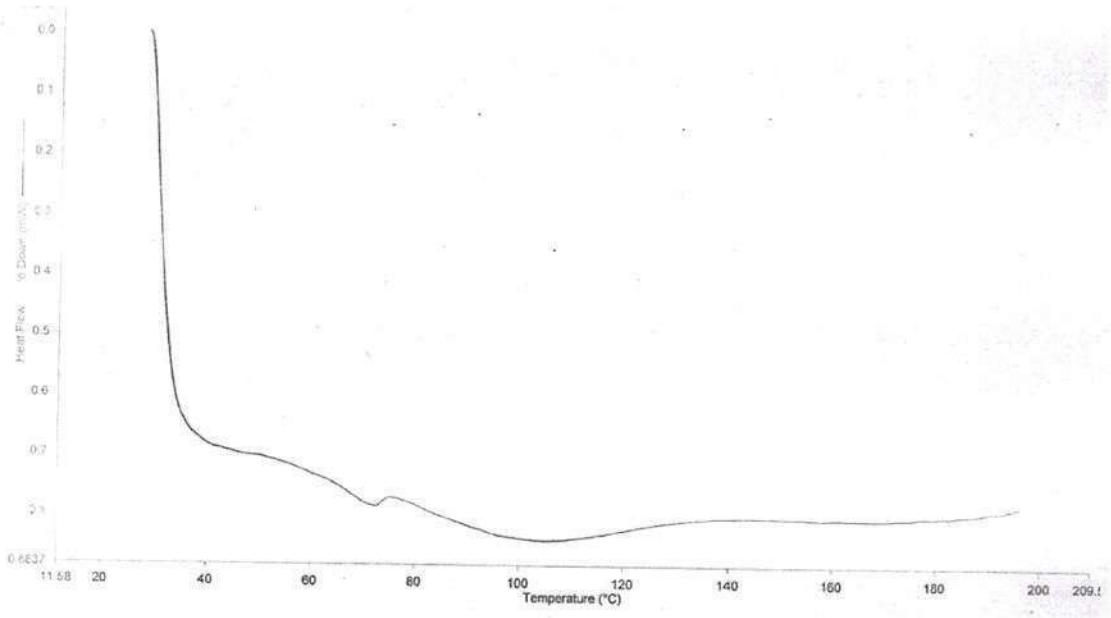
Customer Letter No. Nil, dtd. 04/08/2025

6 Visual **Observation of Compost**

Description	Week 1-4	Week 5-8	Week 9-12
Structure	Fine Particles	Fine Particles	Fine Particles
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	Dark Brown	Dark Brown	Dark Brown
Fungal Development	Nil	Nil	Nil
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

Description	Week 13-16	Week 17-18	Week 19-20
Structure	Fine Particles	Fine Particles	Fine Particles
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	Dark Brown	Dark Brown	Dark Brown
Fungal Development	Nil	Nil	Nil
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

7 DSC **Analysis**



Contd.,

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Technical Officer

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रिपोर्ट सं / REPORT NO. : **84049**

परीक्षण परिणाम / TEST RESULTS

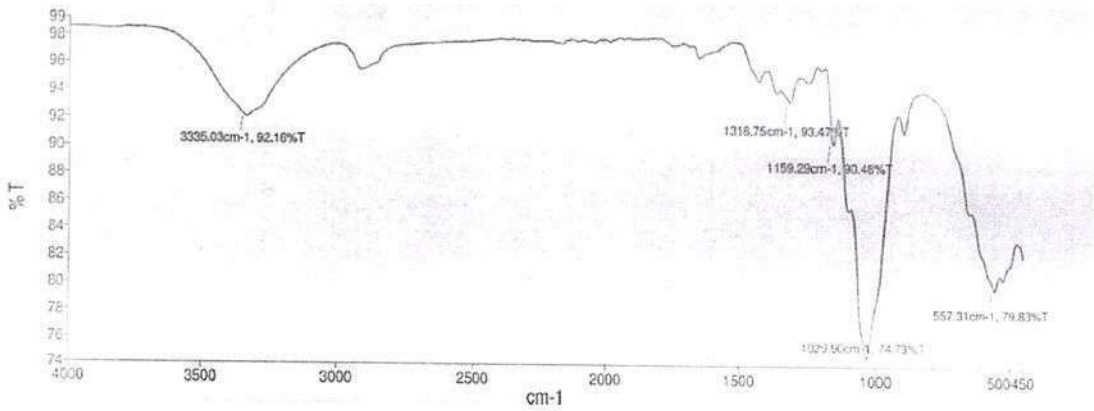
दिनाक /Date : **30-03-2026**

Issued to: YASH LAXMI ECO PACK PVT LTD., Plot No.B25/33-126, Jawahar Nagar Extension, Behlupur, Varansi Uttar Pradesh - 221 010

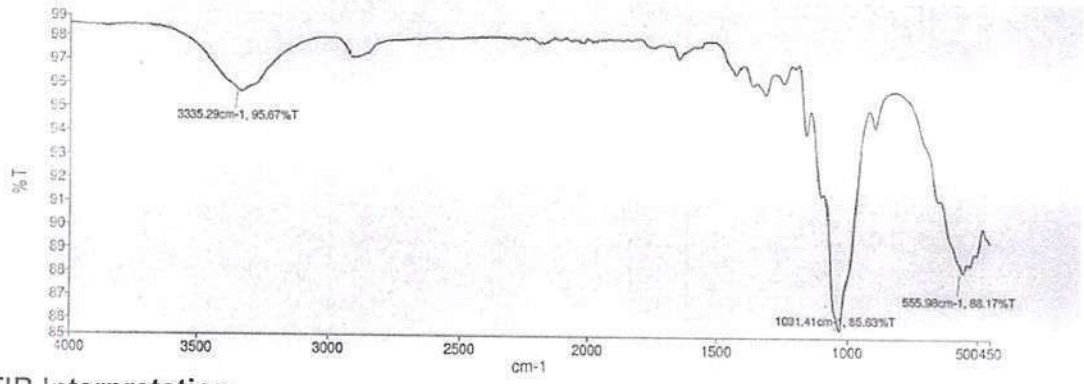
Customer Letter No. Nil, dtd. 04/08/2025

8 FTIR **Analysis**

Side 1



Side 2



FTIR Interpretation

a) Side 1

Wave number (cm^{-1})	Nature of Bond
3335	O-H stretching in cellulose
1316	C=C stretch
1159	C-C stretch
1029	C-O stretch
557	C-H bend

b) Side 2

Wave number (cm^{-1})	Nature of Bond
3335	C-H stretch
1031	C-H in Plane bend
555	C-H bend

Comment: The above DSC & FTIR analysis indicates the above sample is Paper: Cellulose

AUTHORISED SIGNATORY
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रिपोर्ट सं / REPORT NO. : 84049

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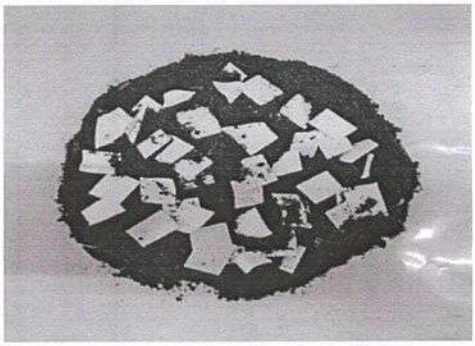
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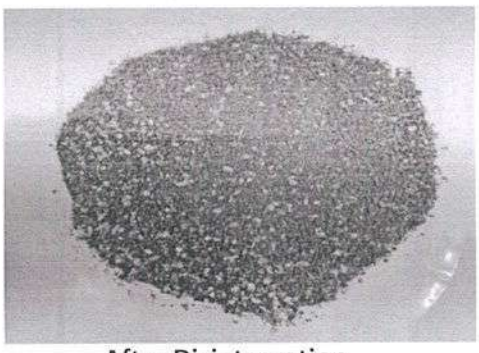
9 **Disintegration After 12 Weeks**

CODE NO: 25081733



Before Disintegration

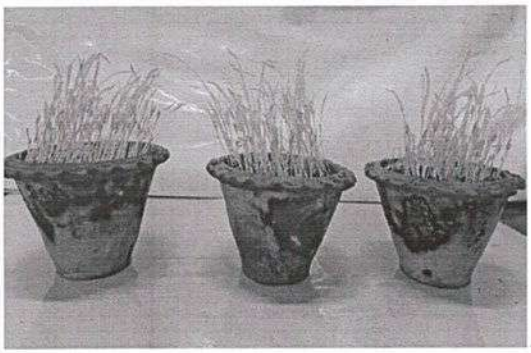
CODE NO: 25081733



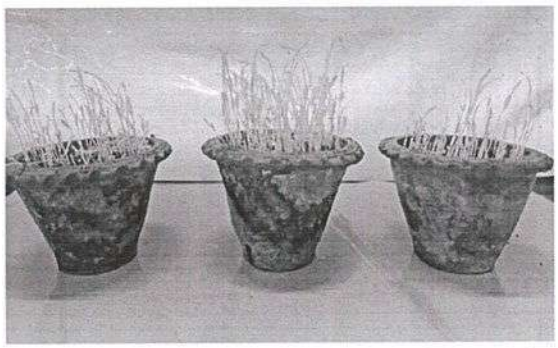
After Disintegration

The disintegration of the supplied sample by passing through 2 mm sieve after 12 week in composting condition as per ISO 17088-2021 was found not more than 10% of original dry mass remain.

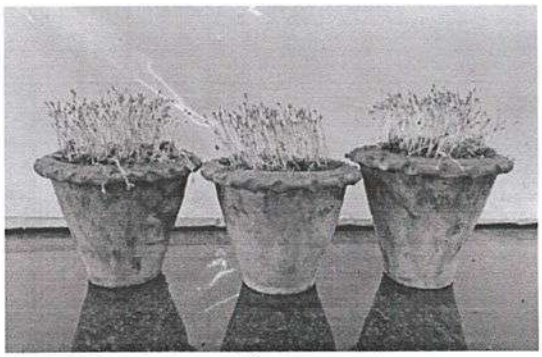
10 **Plant growth study**



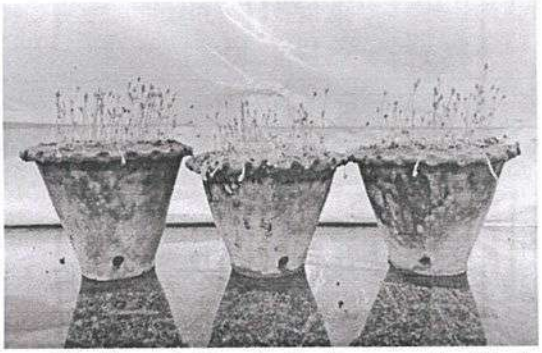
Fresh compost with Sorghum



Bio-degradation tested compost with Sorghum



Fresh compost with Cress



Bio-degradation tested compost with Cress

The percentage of seed germination rate is found to be greater than 90% for both Sorghum and Cress .

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