

SERVO RUBBER SPRAY OIL B

Environment friendly, Biodegradable Oil for Rubber Plantations



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- **Development of Servo Rubber Spray Oil B**
- **Field Evaluations at RRII, Kottayam**
- **Copper residue analysis at IOC R&D**
- **Summary**

Biodegradable Rubber Spray Oils- Background

- **Abnormal leaf fall is common problem in rubber plantations**
- **IOC and RRII jointly worked and introduced high unsulphonated residue(USR) based formulation during 90s**



Biodegradable Rubber Spray Oil, Servo Rubber Spray Oil B

- IOC and RRII again joined hands to study use of bio-degradable conventional rubber spray oils
- New generation **Rubber Spray Oil B** developed using highly refined and biodegradable base oils
- Field studies conducted for three seasons (**2007, 2008 & 2009**) by RRII, Kottayam have proved its efficacy for controlling abnormal leaf fall disease



Evaluation of Servo Rubber Spray Oil B At RRII and IOC R&D



Report on the Evaluation of Bio-degradable Rubber Spray Oil - 2007

Evaluation Studies Conducted by RRII- 2007

- Field studies conducted at Kulathupuzha Estate, Punalur and Pudukad Estate
- Plantations – Mature plantations of susceptible clone RRIM 600

Oil dispersible copper oxychloride(COC) @ 8 kg/ha was dispersed in 40 litres of bio-degradable oil.

Type of oil	Leaf retention(%)	
	Punalur (RRIM 600)	Pudukad (RRIM 600)
Spray oil(1:5)-Recommended	37.1	39.4
Bio-degradable spray oil(1:5)	43.3	46.3

Efficacy of bio-degradable spray oil established

Report on the Evaluation of Bio-degradable Rubber Spray Oil - 2008

Evaluation Studies Conducted by RRII- 2008

Sl. No.	Location	Clone	Type of spraying
1	Pudukad Estate, Trichur	RRIM 600	Micron spraying
2	Kaliyar Estate, Thodupuzha	PB 260	Tractor mounted spraying
3	Boyce Estate, Mundakayam	PB 260	Micron spraying
4	Lahai Estate, Pathanamthitta	RRIM 600	Micron spraying

Oil dispersible copper oxychloride(COC) @ 8 kg/ha was dispersed in 40 litres of bio-degradable oil.

Type of oil	Leaf retention(%)	
	Mundakayam (PB 260)	Trichur (RRIM 600)
Bio-degradable spray oil(1:5)	84.5	65.6
Spray oil(1:5)-Recommended	80.5	43.1

Efficacy of bio-degradable spray oil was comparable to the recommended practice

Determination of Copper Content Retention on Leaves After Spraying

Evaluation Methodology

● Samples

- Dry leaves collected before spraying will be used as blank and after spraying as sample
- Bi-monthly leaves collection by RRII for analysis

● Area Calculation

- The approximate area of the leaves calculated by drawing the outline of leaf on a graph paper and number of squares were measured

● Method

Blank Determination

- Known amount (area and weight) of leaves (BLANK) is burnt in platinum crucible and converted into ash. The residue dissolved in hydrochloric acid of known volume. The solution is then analyzed for copper by PLASMA technique

Sample Determination

- Known The same procedure is adopted on leaves collected after spraying oil. The copper is estimated by plasma in the solution

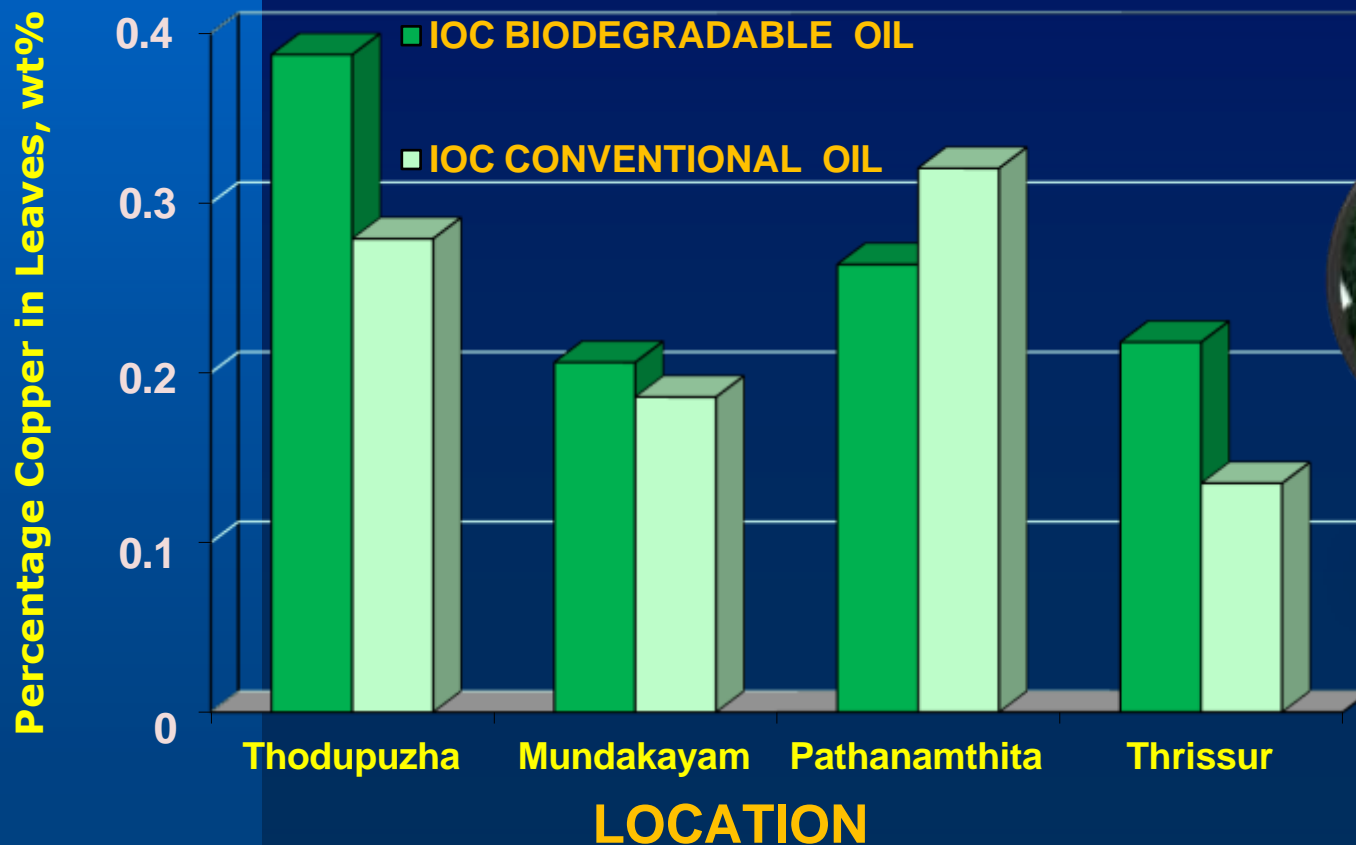
● Calculation and Reporting

- The results of "BLANK" is subtracted from the "SAMPLE" and copper content in leaves is calculated as gm/cm^2



Retention Of Copper Content in Dried Rubber Plant Leaves

Dry Leaves Received During August, 2008



More copper retention observed in Biodegradable Spray Oil

- IOC has developed new generation bio-degradable rubber spray oil "**Servo Rubber Spray Oil B**"
- Field studies conducted for three seasons (**2007, 2008 & 2009**) by RRII, Kottayam have proved its efficacy for controlling abnormal leaf fall disease
- Copper retention property of "**Servo Rubber Spray Oil B**" is **better compared to conventional oil**
- New oil will be safer to use and leaves lesser load on environment



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TEST REPORT

F/OPN/21
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Test Method: OECD 301 B

Name and address of customer	Indian Oil IOCL-Kerala State Office, Kerala		
Report No.	ERRL/60/2023	Test Material/ Sample description	Rubber Spray Oil (B)
Date of Issue	10-08-2023	Sampling By	Customer
Sample ID	ERRL/P12/2022	Condition of sample during the receipt	Satisfactory
Sample Quantity	1 Litre		

1. OBJECTIVE:

To evaluate test substance- **Rubber Spray Oil (B)** as per requirements of OECD 301B: Ready biodegradability in an aerobic aqueous medium.

2. SAMPLE DESCRIPTION:

The test substance submitted by the customer was **Rubber Spray Oil (B)** as given in Figure 1.



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Test Method: OECD 301 B



Figure 2. Test setup for Biodegradation of test and reference substances in replicates

RESULTS:

- The total CO₂ evolution in the inoculum blank at the end of the test was within 40 mg/l medium signifying the viability of inoculum and validates the test method.
- Based on the CO₂ production analysis of the test substance, the increase in the CO₂ confirms the trend of conversion of carbon content in substance to gaseous phase indicating increased rate of biodegradation over the test period of 28 days.
- Gas production from Inoculum, Test and Reference substances in their respective replicates were consistence. Cumulative carbon dioxide (CO₂) evolved over time was used to derive percentage biodegradation of materials.
- Percentage biodegradation of the test substance – **Rubber spray oil (B) sample** found to be **78.5%** where as for the reference substance – Aniline, it was 82.1% at the end of the 28 days



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CONCLUSION:

- **Rubber spray oil (B)** found to be readily biodegradable as it biodegraded more than 60% of ThCO₂ production at the end of the 28 days incubation period.
- On the basis of these results, it can be concluded that test substance- **Rubber spray oil (B)** assessed as per OECD 301 B test method has reached **pass level** for ready biodegradability.

Thank You