

## FORM – A : RESULT OF ONGOING EXPERIMENT

01.	*Experiment number and title (As per CJA)	:	15.4.3.49 and Effect of Different Bamboo Species Leaf Leachate on Germination and Seedling Growth of some Vegetable Crops
02.	Budget Head	:	352/12029
03.	Collaborative department, if any	:	NA
04.	Location and Agro-climatic sub region	:	Bamboo Resource Centre, College of forestry, NAU, Navsari – 396450 and AES-III (Heavy Raifall Zone), South Gujarat
05.	Background Information	:	<p>The bamboo based agroforestry system can play an important role in enhancing productivity, sustainability and resource conservation. Many of useful bamboo species can occupy the same ecological niche as trees and are well suited for agroforestry (Tewari et al., 2015). As a component in agroforestry system, bamboos can reduce erosivity of rainfall/runoff and erodibility of soil and intercept more rainfall, maintain soil health by addition of organic matter through litter fall and improve microclimate by reducing soil and air temperature, solar radiation and wind speed which directly influence the soil evaporation and humidity (Tewari et al., 2015). Besides having many advantages of bamboos in agroforestry systems, various chemicals (allelochemicals) can be released through the process of volatilization, stem flow or litter decomposition and from leaf aqueous leachate in soil. These leachates play a major role in the basic metabolism and affect numerous physiological and biochemical processes of intercrops (Rice, 1984; Narwal and Tauro, 1994). The allelochemicals present in the aqueous leaf leachate can inhibit the growth of some species at certain concentration and at the same time can stimulate the growth of same or different species at lower concentration (Rice, 1984). Allelopathy is of great interest because it can help to establish the combination of intercropping species in an agroforestry system in such a way that donor species have less negative impact on receptor crop. Present study is an attempt to find out the allelopathic effect of different bamboo species leaf leachates on some vegetable crops in control condition.</p>
06.	Objectives	:	<ol style="list-style-type: none"> <li>1. To study the effects of leaf leachate of Bamboo species on germination of different vegetable crops seedling</li> <li>2. To study the effects of leaf leachate of Bamboo species on growth of different vegetable crop seedling</li> </ol>
07.	Investigators	:	<p><b>PI:</b> Dr. Jayesh Pathak (Asst. Prof.) Agroforestry</p> <p><b>Co-PIs:</b> Dr. M. B. Tandel (Asst. Prof.) Forestry Dr. M. K. Desai (Asst. Prof.) Agroforestry</p> <p><b>Associated Scientist:</b> Dr. S. M. Patel (Asst. Prof.) Agroforestry</p>
08.	Year of commencement	:	2019-20
09.	Season	:	NA

10.	Crop and variety	:	<b>Factor –A - Bamboo species</b> <i>T<sub>1</sub>-Bambusa bambos</i> <i>T<sub>2</sub>-Bambusa vulgaris (Green)</i> <i>T<sub>3</sub>-Bambusa balcooa</i> <i>T<sub>4</sub>-Dendrocalamus strictus</i> <i>T<sub>5</sub>-Dendrocalamus stocksii</i> <b>Factor –B - Vegetables</b> V <sub>1</sub> – Brinjal V <sub>2</sub> – Tomato <b>Factor –C – Leaf leachate Concentration</b> L <sub>1</sub> – Control L <sub>2</sub> – 5 % L <sub>3</sub> – 10 % L <sub>4</sub> – 20 % L <sub>5</sub> – 50 % L <sub>6</sub> – 100 %		
11.	Experimental details	:			
	(a)	Treatments	:	60 Treatment Combinations	
	(b)	Design	:	Completely Randomized Design with Factorial Concept (FCRD)	
	(c)	Replications	:	3	
	(d)	Plot size	:	Gross	- _____ m x _____ m
			:	Net	- _____ m x _____ m
12.	Cultural details	:			
	(a)	Previous crops and fertilizers	:	NA	
	(b)	Sowing date	:	NA	
	(c)	Seed rate	:	NA	
	(d)	Spacing	:	NA	
	(e)	manures and fertilizers	:	NA	
	(f)	No. of irrigation with date	:	NA	
	(g)	Cultural operations with date	:	NA	
	(h)	Plant protection measures	:	NA	
	(i)	Harvesting date	:	NA	
13.	Soil analysis	:	NA		
14.	Input analysis	:	NA		
15.	Results (Table/s with statistical analysis and Interpretation)	:	Various concentration of leaf leachate of different bamboo species were applied to tomato and brinjal seed. Germination parameters, growth parameters and biomass mean parameters were recorded and presented in following tables. Remaining parameters will be recorded in prescribed time interval.		

**Table 1. Effect of different concentration of leaf leachate of different bamboo species on germination parameters.**

Treatment Combinations	Germination Percentage (%)	Germination Energy (%)	Seed Vigour Index	Treatment Combinations	Germination Percentage (%)	Germination Energy (%)	Seed Vigour Index
T <sub>1</sub> V <sub>1</sub> L <sub>1</sub>	66.67	0.67	744.48	T <sub>1</sub> V <sub>2</sub> L <sub>1</sub>	76.67	0.77	3654.60
T <sub>1</sub> V <sub>1</sub> L <sub>2</sub>	70.00	0.70	816.67	T <sub>1</sub> V <sub>2</sub> L <sub>2</sub>	46.67	0.47	2335.06
T <sub>1</sub> V <sub>1</sub> L <sub>3</sub>	76.67	0.77	753.92	T <sub>1</sub> V <sub>2</sub> L <sub>3</sub>	63.33	0.63	2835.07
T <sub>1</sub> V <sub>1</sub> L <sub>4</sub>	46.67	0.47	482.26	T <sub>1</sub> V <sub>2</sub> L <sub>4</sub>	63.33	0.63	2752.74
T <sub>1</sub> V <sub>1</sub> L <sub>5</sub>	83.33	0.83	888.85	T <sub>1</sub> V <sub>2</sub> L <sub>5</sub>	63.33	0.63	3229.83
T <sub>1</sub> V <sub>1</sub> L <sub>6</sub>	73.33	0.73	684.41	T <sub>1</sub> V <sub>2</sub> L <sub>6</sub>	70.00	0.70	3472.00
T <sub>2</sub> V <sub>1</sub> L <sub>1</sub>	86.67	0.87	1097.82	T <sub>2</sub> V <sub>2</sub> L <sub>1</sub>	80.00	0.80	3573.33
T <sub>2</sub> V <sub>1</sub> L <sub>2</sub>	73.33	0.73	1222.17	T <sub>2</sub> V <sub>2</sub> L <sub>2</sub>	76.67	0.77	4377.86
T <sub>2</sub> V <sub>1</sub> L <sub>3</sub>	73.33	0.73	950.85	T <sub>2</sub> V <sub>2</sub> L <sub>3</sub>	46.67	0.47	2649.30
T <sub>2</sub> V <sub>1</sub> L <sub>4</sub>	70.00	0.70	910.00	T <sub>2</sub> V <sub>2</sub> L <sub>4</sub>	80.00	0.80	3496.00
T <sub>2</sub> V <sub>1</sub> L <sub>5</sub>	73.33	0.73	928.85	T <sub>2</sub> V <sub>2</sub> L <sub>5</sub>	46.67	0.47	2263.50
T <sub>2</sub> V <sub>1</sub> L <sub>6</sub>	63.33	0.63	918.29	T <sub>2</sub> V <sub>2</sub> L <sub>6</sub>	56.67	0.57	2361.25
T <sub>3</sub> V <sub>1</sub> L <sub>1</sub>	83.33	0.83	1208.29	T <sub>3</sub> V <sub>2</sub> L <sub>1</sub>	86.67	0.87	4128.38
T <sub>3</sub> V <sub>1</sub> L <sub>2</sub>	83.33	0.83	916.63	T <sub>3</sub> V <sub>2</sub> L <sub>2</sub>	53.33	0.53	2664.72
T <sub>3</sub> V <sub>1</sub> L <sub>3</sub>	66.67	0.67	944.49	T <sub>3</sub> V <sub>2</sub> L <sub>3</sub>	66.67	0.67	3433.51
T <sub>3</sub> V <sub>1</sub> L <sub>4</sub>	80.00	0.80	1101.33	T <sub>3</sub> V <sub>2</sub> L <sub>4</sub>	56.67	0.57	2752.27
T <sub>3</sub> V <sub>1</sub> L <sub>5</sub>	80.00	0.80	1066.67	T <sub>3</sub> V <sub>2</sub> L <sub>5</sub>	36.67	0.37	1662.37
T <sub>3</sub> V <sub>1</sub> L <sub>6</sub>	86.67	0.87	967.82	T <sub>3</sub> V <sub>2</sub> L <sub>6</sub>	83.33	0.83	3785.96
T <sub>4</sub> V <sub>1</sub> L <sub>1</sub>	76.67	0.77	853.59	T <sub>4</sub> V <sub>2</sub> L <sub>1</sub>	76.67	0.77	3368.37
T <sub>4</sub> V <sub>1</sub> L <sub>2</sub>	73.33	0.73	870.18	T <sub>4</sub> V <sub>2</sub> L <sub>2</sub>	46.67	0.47	2247.94
T <sub>4</sub> V <sub>1</sub> L <sub>3</sub>	66.67	0.67	697.81	T <sub>4</sub> V <sub>2</sub> L <sub>3</sub>	40.00	0.40	2086.67
T <sub>4</sub> V <sub>1</sub> L <sub>4</sub>	70.00	0.70	639.33	T <sub>4</sub> V <sub>2</sub> L <sub>4</sub>	63.33	0.63	2562.75
T <sub>4</sub> V <sub>1</sub> L <sub>5</sub>	63.33	0.63	778.96	T <sub>4</sub> V <sub>2</sub> L <sub>5</sub>	66.67	0.67	2800.14
T <sub>4</sub> V <sub>1</sub> L <sub>6</sub>	80.00	0.80	946.67	T <sub>4</sub> V <sub>2</sub> L <sub>6</sub>	50.00	0.50	1966.67
T <sub>5</sub> V <sub>1</sub> L <sub>1</sub>	90.00	0.90	1197.00	T <sub>5</sub> V <sub>2</sub> L <sub>1</sub>	80.00	0.80	3957.33
T <sub>5</sub> V <sub>1</sub> L <sub>2</sub>	90.00	0.90	1146.00	T <sub>5</sub> V <sub>2</sub> L <sub>2</sub>	66.67	0.67	3291.28
T <sub>5</sub> V <sub>1</sub> L <sub>3</sub>	43.33	0.43	596.51	T <sub>5</sub> V <sub>2</sub> L <sub>3</sub>	73.33	0.73	3461.18
T <sub>5</sub> V <sub>1</sub> L <sub>4</sub>	60.00	0.60	640.00	T <sub>5</sub> V <sub>2</sub> L <sub>4</sub>	46.67	0.47	1880.80
T <sub>5</sub> V <sub>1</sub> L <sub>5</sub>	56.67	0.57	678.15	T <sub>5</sub> V <sub>2</sub> L <sub>5</sub>	66.67	0.67	3069.04
T <sub>5</sub> V <sub>1</sub> L <sub>6</sub>	70.00	0.70	898.33	T <sub>5</sub> V <sub>2</sub> L <sub>6</sub>	70.00	0.70	2767.33

**Table 2. Effect of different concentration of leaf leachate of different bamboo species on growth parameters.**

<b>Treatment Combinations</b>	<b>Shoot length (cm)</b>	<b>Root length (cm)</b>	<b>Treatment Combinations</b>	<b>Shoot length (cm)</b>	<b>Root length (cm)</b>
T <sub>1</sub> V <sub>1</sub> L <sub>1</sub>	11.17	10.00	T <sub>1</sub> V <sub>2</sub> L <sub>1</sub>	47.67	12.40
T <sub>1</sub> V <sub>1</sub> L <sub>2</sub>	11.67	7.93	T <sub>1</sub> V <sub>2</sub> L <sub>2</sub>	50.03	14.07
T <sub>1</sub> V <sub>1</sub> L <sub>3</sub>	9.83	8.90	T <sub>1</sub> V <sub>2</sub> L <sub>3</sub>	44.77	17.87
T <sub>1</sub> V <sub>1</sub> L <sub>4</sub>	10.33	8.43	T <sub>1</sub> V <sub>2</sub> L <sub>4</sub>	43.47	11.73
T <sub>1</sub> V <sub>1</sub> L <sub>5</sub>	10.67	10.83	T <sub>1</sub> V <sub>2</sub> L <sub>5</sub>	51.00	11.77
T <sub>1</sub> V <sub>1</sub> L <sub>6</sub>	9.33	5.83	T <sub>1</sub> V <sub>2</sub> L <sub>6</sub>	49.60	11.73
T <sub>2</sub> V <sub>1</sub> L <sub>1</sub>	12.67	7.67	T <sub>2</sub> V <sub>2</sub> L <sub>1</sub>	44.67	11.07
T <sub>2</sub> V <sub>1</sub> L <sub>2</sub>	16.67	7.17	T <sub>2</sub> V <sub>2</sub> L <sub>2</sub>	57.10	12.13
T <sub>2</sub> V <sub>1</sub> L <sub>3</sub>	12.97	9.47	T <sub>2</sub> V <sub>2</sub> L <sub>3</sub>	56.77	10.53
T <sub>2</sub> V <sub>1</sub> L <sub>4</sub>	13.00	8.17	T <sub>2</sub> V <sub>2</sub> L <sub>4</sub>	43.70	10.00
T <sub>2</sub> V <sub>1</sub> L <sub>5</sub>	12.67	8.17	T <sub>2</sub> V <sub>2</sub> L <sub>5</sub>	48.50	10.13
T <sub>2</sub> V <sub>1</sub> L <sub>6</sub>	14.50	10.00	T <sub>2</sub> V <sub>2</sub> L <sub>6</sub>	41.67	8.70
T <sub>3</sub> V <sub>1</sub> L <sub>1</sub>	14.50	6.43	T <sub>3</sub> V <sub>2</sub> L <sub>1</sub>	47.63	13.47
T <sub>3</sub> V <sub>1</sub> L <sub>2</sub>	11.00	11.90	T <sub>3</sub> V <sub>2</sub> L <sub>2</sub>	49.97	9.37
T <sub>3</sub> V <sub>1</sub> L <sub>3</sub>	14.17	10.33	T <sub>3</sub> V <sub>2</sub> L <sub>3</sub>	51.50	11.33
T <sub>3</sub> V <sub>1</sub> L <sub>4</sub>	13.77	10.90	T <sub>3</sub> V <sub>2</sub> L <sub>4</sub>	48.57	11.60
T <sub>3</sub> V <sub>1</sub> L <sub>5</sub>	13.33	7.60	T <sub>3</sub> V <sub>2</sub> L <sub>5</sub>	45.33	11.67
T <sub>3</sub> V <sub>1</sub> L <sub>6</sub>	11.17	9.77	T <sub>3</sub> V <sub>2</sub> L <sub>6</sub>	45.43	9.73
T <sub>4</sub> V <sub>1</sub> L <sub>1</sub>	11.13	5.80	T <sub>4</sub> V <sub>2</sub> L <sub>1</sub>	43.93	11.87
T <sub>4</sub> V <sub>1</sub> L <sub>2</sub>	11.87	12.00	T <sub>4</sub> V <sub>2</sub> L <sub>2</sub>	48.17	12.17
T <sub>4</sub> V <sub>1</sub> L <sub>3</sub>	10.47	10.93	T <sub>4</sub> V <sub>2</sub> L <sub>3</sub>	52.17	11.87
T <sub>4</sub> V <sub>1</sub> L <sub>4</sub>	9.13	9.43	T <sub>4</sub> V <sub>2</sub> L <sub>4</sub>	40.47	7.77
T <sub>4</sub> V <sub>1</sub> L <sub>5</sub>	12.30	12.00	T <sub>4</sub> V <sub>2</sub> L <sub>5</sub>	42.00	8.40
T <sub>4</sub> V <sub>1</sub> L <sub>6</sub>	11.83	8.63	T <sub>4</sub> V <sub>2</sub> L <sub>6</sub>	39.33	6.87
T <sub>5</sub> V <sub>1</sub> L <sub>1</sub>	13.30	12.37	T <sub>5</sub> V <sub>2</sub> L <sub>1</sub>	49.47	14.03
T <sub>5</sub> V <sub>1</sub> L <sub>2</sub>	12.73	10.87	T <sub>5</sub> V <sub>2</sub> L <sub>2</sub>	49.37	10.40
T <sub>5</sub> V <sub>1</sub> L <sub>3</sub>	13.77	12.50	T <sub>5</sub> V <sub>2</sub> L <sub>3</sub>	47.20	11.67
T <sub>5</sub> V <sub>1</sub> L <sub>4</sub>	10.67	9.17	T <sub>5</sub> V <sub>2</sub> L <sub>4</sub>	40.30	13.13
T <sub>5</sub> V <sub>1</sub> L <sub>5</sub>	11.97	7.37	T <sub>5</sub> V <sub>2</sub> L <sub>5</sub>	46.03	12.10
T <sub>5</sub> V <sub>1</sub> L <sub>6</sub>	12.83	10.23	T <sub>5</sub> V <sub>2</sub> L <sub>6</sub>	39.53	10.90

**Table 3. Effect of different concentration of leaf leachate of different bamboo species on biomass parameters.**

Treatment Combinations	Fresh weight of Shoot (g)	Fresh weight of Root (g)	Fresh weight of plant (g)	Treatment Combinations	Fresh weight of Shoot (g)	Fresh weight of Root (g)	Fresh weight of plant (g)
T <sub>1</sub> V <sub>1</sub> L <sub>1</sub>	5.67	0.83	6.50	T <sub>1</sub> V <sub>2</sub> L <sub>1</sub>	22.33	2.00	24.33
T <sub>1</sub> V <sub>1</sub> L <sub>2</sub>	4.67	1.17	5.83	T <sub>1</sub> V <sub>2</sub> L <sub>2</sub>	17.33	4.00	21.33
T <sub>1</sub> V <sub>1</sub> L <sub>3</sub>	4.67	1.10	5.77	T <sub>1</sub> V <sub>2</sub> L <sub>3</sub>	17.00	2.00	19.00
T <sub>1</sub> V <sub>1</sub> L <sub>4</sub>	5.33	1.10	6.43	T <sub>1</sub> V <sub>2</sub> L <sub>4</sub>	12.00	0.97	12.97
T <sub>1</sub> V <sub>1</sub> L <sub>5</sub>	5.00	0.93	5.93	T <sub>1</sub> V <sub>2</sub> L <sub>5</sub>	26.33	2.60	28.93
T <sub>1</sub> V <sub>1</sub> L <sub>6</sub>	5.33	1.00	6.33	T <sub>1</sub> V <sub>2</sub> L <sub>6</sub>	23.33	2.00	25.33
T <sub>2</sub> V <sub>1</sub> L <sub>1</sub>	5.33	0.93	6.27	T <sub>2</sub> V <sub>2</sub> L <sub>1</sub>	18.67	1.50	20.17
T <sub>2</sub> V <sub>1</sub> L <sub>2</sub>	5.67	0.87	6.53	T <sub>2</sub> V <sub>2</sub> L <sub>2</sub>	22.67	2.00	24.67
T <sub>2</sub> V <sub>1</sub> L <sub>3</sub>	6.00	0.90	6.90	T <sub>2</sub> V <sub>2</sub> L <sub>3</sub>	20.00	2.97	22.97
T <sub>2</sub> V <sub>1</sub> L <sub>4</sub>	6.00	0.90	6.90	T <sub>2</sub> V <sub>2</sub> L <sub>4</sub>	11.33	0.90	12.23
T <sub>2</sub> V <sub>1</sub> L <sub>5</sub>	5.33	0.90	6.23	T <sub>2</sub> V <sub>2</sub> L <sub>5</sub>	14.67	1.57	16.23
T <sub>2</sub> V <sub>1</sub> L <sub>6</sub>	6.33	0.90	7.23	T <sub>2</sub> V <sub>2</sub> L <sub>6</sub>	12.00	1.23	13.23
T <sub>3</sub> V <sub>1</sub> L <sub>1</sub>	5.00	0.90	5.90	T <sub>3</sub> V <sub>2</sub> L <sub>1</sub>	28.33	2.00	30.33
T <sub>3</sub> V <sub>1</sub> L <sub>2</sub>	4.33	0.70	5.03	T <sub>3</sub> V <sub>2</sub> L <sub>2</sub>	13.67	1.27	14.93
T <sub>3</sub> V <sub>1</sub> L <sub>3</sub>	6.00	0.73	6.73	T <sub>3</sub> V <sub>2</sub> L <sub>3</sub>	14.67	1.97	16.63
T <sub>3</sub> V <sub>1</sub> L <sub>4</sub>	6.00	0.80	6.80	T <sub>3</sub> V <sub>2</sub> L <sub>4</sub>	12.33	0.97	13.30
T <sub>3</sub> V <sub>1</sub> L <sub>5</sub>	7.33	0.93	8.27	T <sub>3</sub> V <sub>2</sub> L <sub>5</sub>	10.00	0.97	10.97
T <sub>3</sub> V <sub>1</sub> L <sub>6</sub>	6.00	0.97	6.97	T <sub>3</sub> V <sub>2</sub> L <sub>6</sub>	15.33	1.13	16.47
T <sub>4</sub> V <sub>1</sub> L <sub>1</sub>	6.00	1.00	7.00	T <sub>4</sub> V <sub>2</sub> L <sub>1</sub>	19.00	1.67	20.67
T <sub>4</sub> V <sub>1</sub> L <sub>2</sub>	4.67	0.87	5.53	T <sub>4</sub> V <sub>2</sub> L <sub>2</sub>	11.67	0.97	12.63
T <sub>4</sub> V <sub>1</sub> L <sub>3</sub>	6.00	0.70	6.70	T <sub>4</sub> V <sub>2</sub> L <sub>3</sub>	15.33	1.67	17.00
T <sub>4</sub> V <sub>1</sub> L <sub>4</sub>	6.00	0.80	6.80	T <sub>4</sub> V <sub>2</sub> L <sub>4</sub>	7.67	0.87	8.53
T <sub>4</sub> V <sub>1</sub> L <sub>5</sub>	5.33	0.90	6.23	T <sub>4</sub> V <sub>2</sub> L <sub>5</sub>	8.33	0.70	9.03
T <sub>4</sub> V <sub>1</sub> L <sub>6</sub>	5.67	0.87	6.53	T <sub>4</sub> V <sub>2</sub> L <sub>6</sub>	7.33	0.60	7.93
T <sub>5</sub> V <sub>1</sub> L <sub>1</sub>	5.67	0.90	6.57	T <sub>5</sub> V <sub>2</sub> L <sub>1</sub>	19.67	3.00	22.67
T <sub>5</sub> V <sub>1</sub> L <sub>2</sub>	6.00	0.93	6.93	T <sub>5</sub> V <sub>2</sub> L <sub>2</sub>	11.33	1.33	12.67
T <sub>5</sub> V <sub>1</sub> L <sub>3</sub>	6.67	0.90	7.57	T <sub>5</sub> V <sub>2</sub> L <sub>3</sub>	9.67	1.00	10.67
T <sub>5</sub> V <sub>1</sub> L <sub>4</sub>	4.33	0.70	5.03	T <sub>5</sub> V <sub>2</sub> L <sub>4</sub>	7.00	1.00	8.00
T <sub>5</sub> V <sub>1</sub> L <sub>5</sub>	4.67	0.70	5.37	T <sub>5</sub> V <sub>2</sub> L <sub>5</sub>	13.00	1.67	14.67
T <sub>5</sub> V <sub>1</sub> L <sub>6</sub>	5.33	0.90	6.23	T <sub>5</sub> V <sub>2</sub> L <sub>6</sub>	8.33	1.00	9.33

**Plate 1. Effect of different concentration of leaf leachate of different bamboo species on germination, growth and biomass parameters.**



16.	Remarks (for abnormal experimental results only)	: NA
17.	Reasons for abnormal conditions affecting experimental results and low yield if any be given in brief. e.g. uneven plant stand, pest and disease incidence, weather conditions, etc.	: NA
18.	Any other information	: e.g. Modification in previous year experiment