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CASE STUDIES ON IMPACT OF ORGANIC AND BIO MULCHES IN

BABYCORN CULTIVATION

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INTRODUCTION

Babycom is a special derivative of genus *Zea mays* L. in which the ear is harvested within 2-3 days of silking i.e., prior to fertilization, which is dehusked and served as a vegetable. Cultivation of babycorn provides tremendous avenues for diversification, value addition and revenue generation. After successful venture in many Southeast Asian countries, it is gaining fast popularity in Indian market too, particularly in metropolitan cities. The productivity of this crop can be increased by reducing weed infestation for which an important organic optimal 'mulching' can be practiced. Mulching effectively recycle organic wastes, minimize evaporation of water, controls weed infestation, reduce runoff and soil loss, increase soil moisture status controlling soil temperature fluctuation, improves physical, chemical and biological properties of soil which leads to better yield of crop. Another weed controlling aspects in cropping system is the weed suppressing ability of biomulches. Keeping the above aspect in view, the study has been formulated.

MATERIALS AND METHODS

An experiment was carried out at the Department of Horticulture, Faculty of Agriculture, Annamalai University during 2001-2002. The field was laid out in a Randomized Block Design consisting 24 plots with eight treatments (T₁ to T₈) each replicated thrice. Seeds of babycorn variety CoBC-1 were sown at a spacing of 60 x 30 cm. The treatments include T₀- control, T₁, - dried water hyacinth at 10 cm thickness (10 t ha⁻¹) T₂ - sugarcane trash at 10 cm thickness (12 t ha⁻¹), T₃ - coirpith 2 cm thickness (10 t ha⁻¹) and T₄ - sawdust at 2 cm thickness (10 t ha⁻¹) as mulch materials. They were spread in the field after 15 DAS (Days After Sowing) of babycorn. Fenugreek (T₇) and coriander (T₆) were sown

after 15 DAS and cuttings of mint (T_5) were planted after 20 DAS of the main crop respectively. Standard horticultural practices and plant protection measures were followed uniformly. Observations taken on biometric characters were statistically analysed following the methods of Panse and Sukhatme (1978).

RESULTS AND DISCUSSION

Among the different mulch materials tried, growth characters like plant height (185.29 and 182.68 cm), number of leaves per plant (15.53 and 15.60) and leaf area index (6.97 and 6.80) recorded were significantly superior in sugarcane trash mulching followed by coir pith mulching, water hyacinth mulching, bio mulching and sawdust mulching during both the crop seasons. The increase in plant height might be due to maintenance of soil temperature, moisture, increased nutrient supply and increased activity of microorganisms under respective treatment. Mulching with sugarcane trash, coir pith and water hyacinth residue significantly influenced the dry matter production. The maximum dry matter production (12.14 and 11.77) was observed in T_2 , (sugarcane trash mulching). The present result is in Tables 1 and 2 concordance with Yadav *et al.* (1987) in sugarcane and Raja gopal and Velu (1995) in soybean.

The highest value for number of cobs per plant (2.71 and 2.66), cob length (28.48 and 29.30 cm), cob girth (9.56 and 9.81 cm), cob weight (95.94 and 96.65 g), cob yield (12.32 and 12.80 kg plot¹/10.43 and 10.67 t ha⁻¹), stover yield (30.77 and 30.97 t ha⁻¹) and harvest index (25.31 and 25.48) were higher in the treatment T_2 in which sugarcane trash mulching was done (Table 4). The reason for the above result is that sugarcane trash when applied at 10 cm thickness provided dense ground cover over the soil surface. This would have efficiently controlled the evaporation of water thereby retaining more moisture and increasing the availability of nutrients to baby corn which in turn increased yielded the best. This result is in concordance with the findings of Elumalai (1997) in maize and Hooda *et al.* (1999) who recorded increased fruit weight of tomato under sugarcane trash mulching. The application of coir pith at a thickness of 2 cm did not effectively control water loss as well as weed penetration. As water hyacinth was light in weight, this also did not contribute to density. So coir pith and water hyacinth residue mulching were not that effective as sugarcane mulching is influencing growth and yield components.



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In the bio mulching practice, coriander formed a good cover over the soil. Mint was slow growing and fenugreek though fast growing did not provide good pound cover. So mint and fenugreek bio mulching were not effective in increasing the growth components as that of coriander bio mulching. The noteworthy low growth and yield of baby corn with sawdust mulch was probably because of its chemical components which acted as growth retardants (Chhangani, 1998).

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Table 1. Effects of organic and bio-mulches on different growth characters of baby corn var. CoBC.1

Treatments	Plant height (cm)		Number of leaves per plant		Leaf area index		Dry matter production	
	I Crop	II Crop	I Crop	II Crop	I Crop	II Crop	I Crop	II Crop
T ₀ - Control	121.23	120.43	9.09	9.06	4.82	5.23	5.03	4.99
T ₁ - Water hyacinth residue at 5 cm thickness.	160.43	160.76	11.91	11.97	6.42	6.43	10.40	10.35
T ₂ - Sugarcane trash at 10 cm thickness	185.29	182.68	15.53	15.60	6.97	6.80	12.14	11.77
T ₃ - Coirpith at 2 cm thickness	169.59	173.64	13.51	13.55	6.52	6.49	11.75	11.43
T ₄ - Sawdust at 2 cm thickness	130.09	129.98	9.96	9.94	6.21	6.22	7.30	7.31
T ₅ - Mint as-bio-mulch	147.73	147.90	11.03	11.06	6.26	6.28	8.26	8.32
T ₆ - Coriander as bio-mulch	156.46	157.47	11.25	11.70	6.40	6.41	8.87	8.79
T ₇ - Fenugreek as bio-mulch	138.87	138.65	10.47	10.54	6.25	6.27	8.23	8.16
S.Ed.	4.29	4.33	0.49	0.45	0.18	0.15	0.15	0.14
CD (p=0.05)	8.59	8.66	1.00	0.91	0.37	0.30	0.30	0.29



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Table 2. Effects of organic and bio-mulches on yield attributes of baby corn var. CoBC.1

Treatments	Number of cobs per plant		Cob length (cm)		Cob girth (cm)		Cob weight (g)	
	I Crop	II Crop	I Crop	II Crop	I Crop	II Crop	I Crop	II Crop
T ₀ - Control	1.02	1.00	15.48	15.00	6.74	6.85	60.54	61.46
T ₁ - Water hyacinth residue at 5 cm thickness.	220	2.23	24.91	24.06	8.45	8.48	90.85	90.51
T ₂ - Sugarcane trash at 10 cm thickness	2.71	2.66	28.48	29.30	9.6	9.81	95.94	96.65
T ₃ - Coirpith at 2 cm thickness	2.43	2.46	26.52	26.75	9.05	9.09	93.20	93.50
T ₄ - Sawdust at 2 cm thickness	123	1.22	17.73	17.02	7.52	7.51	75.50	75.82
T ₅ - Mint as-bio-mulch	1.60	1.44	19.73	19.62	8.16	8.27	85.80	88.57
T ₆ - Coriander as bio-mulch	1.80	1.74	23.21	22.40	8.7	8.42	89.10	90.15
T ₇ - Fenugreek as bio-mulch	1.30	1.26	19.46	19.19	7.85	7.87	81.23	85.60
S.Ed.	0.09	0.08	0.80	0.77	0.23	0.25	1.15	1.17



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CD (p=0.05)	0.19	0.17	1.60	1.55	0.47	0.50	2.31	2.35
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Table 3. Effects of organic and bio-mulches on yield attributes of babycorn var. CoBC.1

Treatments	Yield (kg plot ⁻¹)		Stover yield (t ha ⁻¹)		Harvest Index	
	I Crop	II Crop	I Crop	II Crop	I Crop	II Crop
T₀ - Control	3.62	3.62	15.71	15.85	16.09	16.00
T₁ - Water hyacinth residue at 5 cm thickness.	9.98	9.56	27.93	28.07	22.95	22.71
T₂ - Sugarcane trash at 10 cm thickness	12.32	12.80	30.77	30.97	25.31	25.48
T₃ - Coirpith at 2 cm thickness	10.98	11.25	29.16	29.83	23.88	23.92
T₄ - Sawdust at 2 cm thickness	4.44	4.50	17.30	17.59	17.54	17.57
T₅ - Mint as-bio-mulch	6.58	6.57	20.90	20	20.80	21.24
T₆ - Coriander as bio-mulch	7.28	7.56	22.00	22.60	21.62	21.79
T₇ - Fenugreek as bio-mulch	5.06	5.03	18.22	18.06	18.84	18.88
S.Ed.	0.29	0.26	0.54	0.61	0.42	0.45
CD (p=0.05)	0.58	0.52	1.09	1.21	0.85	0.90



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Table 4. Effects of organic and bio-mulches on yield characters of babycorn var. CoBC.1

Treatments	Yield (t ha ⁻¹)		Bio-mulch green yield (t ha ⁻¹)		Equivalent yield (t ha ⁻¹)	
	I Crop	II Crop	I Crop	II Crop	I Crop	II Crop
T₀ - Control	3.02	3.02	-	-	-	~
T₁ - Water hyacinth residue at 5 cm thickness.	8.32	7.97	-	-	-	-
T₂ - Sugarcane trash at 10 cm thickness	10.43	10.67	-	-	-	-
T₃ - Coirpith at 2 cm thickness	9.15	9.38	-	-	-	-
T₄ - Sawdust at 2 cm thickness	3.70	3.74	-	-	-	-
T₅ - Mint as-bio-mulch	5.49	5.48	2.96	2.90	8.45	838
T₆ - Coriander as bio-mulch	6.07	6.30	3.71	3.48	10.15	10.12
T₇ - Fenugreek as bio-mulch	4.23	4.19	3.45	332	836	8.17



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S.Ed.	025	0.22	0.08	0.07	0.14	0.11
CD (p=0.05)	0.51	0.44	0.16	0.07	0.26	0.23