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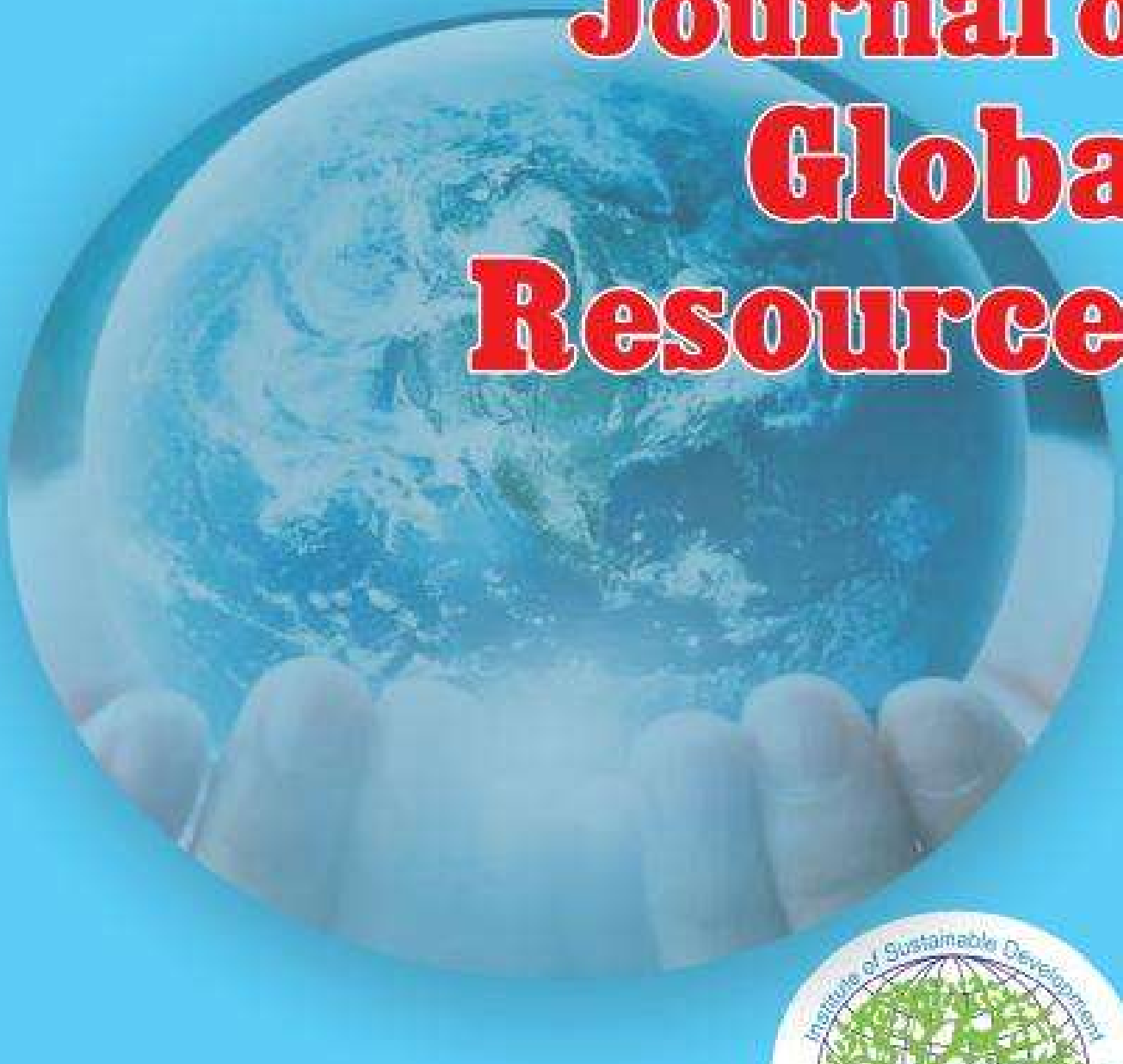

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POTENTIAL OF HERBAGE MIXTURE AS SILAGE PREPARED WITH MECHANICAL PRETREATMENT.

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Abstract:
Production of green foliage in favorable season is easy to have large amount of green fodder. But during summer season there is acute scarcity of fodder in many parts of the country. Preparation of silage from surplus fodder is one of the ideal methods to conserve forage in semi green condition, with good nutritive value. During ensilaging lactic acid producing bacteria grows fast and preserve forage in acidic media. Mechanical treatments like chopping, pulping and pressing are beneficial for releasing cell content and decreases ph.
Key words: fodder, silage, pretreatments, pulping, pressing

Introduction: Large production of fodder can be obtained from fodder crops by using fertilizers or by adapting inter cropping practice. Producing large amount of foliages is possible during monsoon and winter. During summer however, irrigation facilities are not available in several parts of Marathwada region. Therefore it is difficult to raise fodder crops. There is an acute shortage of forage during summer. To overcome this situation the surplus fodder available during favorable season .may be preserve to use during scarcity, produces lactic acid

Preservation of fodder as silage is easy and popular method. The fresh green was ensiled in the silos under anaerobic conditions. During ensilaging lactic acid producing bacteria grows fast, produces lactic acid decreases pH of mass and preserve the nutrients. Good silage is wet, palatable and nutritious. If silage made properly, it serves as a better feed to animals with greater dietary intake. Attempts were made to evaluate the potential of fodder for silage preparation.

Experimental: To obtained green foliages the fodder crops viz. Bajra, Cowpea and **Dolichos** were cultivated in the Dr. Babasaheb Ambedkar Marathwada University Botanical Garden. A piece of land was prepared by ploughing and cross ploughing. That land then divided in to 16.48 m^2 plots. The sowing was done by hands in rows 30.5 cm apart. The foliages were harvested at preflowering stage with steel cutter and immediately brought to laboratory. The vegetation was processed with mechanical treatments like chopping, pulping and pressing by using steel cutter, IBP pulper and bench press (Davys and Pirie 1969; Davys et al 1969).

The material then placed in plastic container (16.5 x 9.0 cm) and pressed to make it compact and exclude air. The mouth of container was sealed with wax. The container i.e. laboratory silos kept in dark for 30 days. After 30 days silos were opened and physical characters of resulted silage were examined i.e. colour, odour, and texture etc. A sample of fresh silage was taken for determination of pH, titratable acidity, (TA), Total Volatile Fatty Acids (TVFA)and Lactic acid (LA). Another sample of was dried in an electric at 95^o +/- 5^o Ctill constant weight. The dried samples were grind to a fine powder and used for subsequent analysis.

Result and Discussion Table -1 information about chemical composit5ion of silage made from foliages of bajra, **Dolichos**, cowpea and mixture of bajra with either **Dolichos** or with cowpea. In the mixture both crops were taken in equal proportion. The moisture content in chopped / pulped material was ranging from 71.4 to 80.5 while in pressed material from 69.3 to77.0%. A significant variation was observed in moisture content among the material ensiled and also due to mechanical treatment offered. In general the pressed crop residue with low moisture content, which is desirable character for silage making (Oelshlegel et al. 1969, Mungikar and Joshi 1976) .

Unpressed material always shows higher values for titratable acidity indicating acid fermentation where as pressed material showed lower values for TA. The buffering capacity (BC) varied widely, however the variation was non-significant. Silage made from bajra had lower BC may be due to low protein content in it, as also pointed out by Reddy and Mungikar (1987). In all silage samples

Crop	State of crop	Titratable Acidity m-equiv/ 100 g DM	Buffering capacity m-equiv/ 100 g DM	pH	Total Volatile Fatty Acids mM/100 g	Water Soluble Reducing Sugars %of DM	% Moisture

pH values are always more than 4.35 it was as high as 5.84 in cowpea + **Dolichos** chopped

Crop	State of crop	% Dry Matter (DM)	% of Dry Matter(DM)								
			Crude Protein	Crude Fibre	Crude Fat	Ash	ASA	NFE	TC	Ca	P
Bajra	Chopped	20.5	15.0	34.3	4.3	16.2	12.9	30.2	64.5	0.33	0.22
	Pulped	22.5	15.9	35.8	4.6	18.1	12.8	25.6	61.4	0.35	0.28
	Pressed	28.5	14.6	39.9	3.1	14.8	9.9	27.6	67.5	0.32	0.18
Cowpea	Chopped	20.0	20.7	25.4	1.8	16.8	6.8	35.3	60.7	1.00	0.43
	Pulped	19.5	21.9	28.2	2.0	15.3	6.9	32.6	60.8	1.12	0.49
	Pressed	23.0	18.8	37.3	1.3	14.4	5.7	28.2	65.5	0.98	0.26
Dolichos	Chopped	25.5	20.9	26.4	2.9	20.3	10.3	29.5	55.9	1.35	0.73
	Pulped	24.9	21.0	26.6	3.0	19.5	10.2	29.9	56.5	1.40	0.75
	Pressed	28.7	15.1	35.3	2.4	21.8	9.9	25.1	60.4	1.25	0.65
Bajra + Cowpea	Chopped	20.6	18.7	32.3	4.7	18.3	12.1	26.0	58.3	0.74	0.19
	Pulped	21.2	19.5	34.1	5.0	17.9	11.3	23.5	57.6	0.68	0.24
	Pressed	28.0	17.8	35.5	4.2	16.1	12.4	26.4	61.9	0.64	0.21
Bajra +Dolichos	Chopped	23.5	17.5	34.7	4.7	16.8	8.8	26.3	61.0	0.81	0.42
	Pulped	25.0	19.6	38.4	5.0	17.5	10.5	19.5	57.9	0.84	0.63
	Pressed	30.7	16.1	40.2	4.3	16.2	8.9	23.2	63.4	0.78	0.48
Cowpea +Dolichos	Chopped	19.5	19.4	32.3	1.8	19.7	13.1	27.1	59.4	1.42	0.37
	Pulped	21.0	20.1	36.4	2.2	17.4	11.8	23.9	60.3	1.66	0.45
	Pressed	27.0	18.8	41.7	1.3	16.5	9.9	21.7	63.4	1.50	0.39

silage. While silage samples made from pulped and pressed foliages of bajra shows pH values near 3.9. McDonald and Henderson (1962) suggested that good silage has pH within the range of 3.8 to 4.2. In view of this looking at pH values all silage samples were not upto the mark. This might be due to low lactic acid production and high buffering capacity values.

Table 1: Effect of mechanical treatments (chopping, pulping and pressing)on quality of silage made from Bajra, cowpea and **Dolichos**

There was a considerable variation in content of TVF Arranged from 2.6 to 9.8. the variation was statistically significant and in general bajra + **Dolichos** silage gives higher values for TVFA. The water soluble reducing sugars content ranged between 0.65 to 2.40 % depending on species and state of crop. The dry matter content in **Dolichos** was high among the entire crop. In the pressed foliages an increase in dry matter content was noticed due to removal of moisture and nutrients in the juice. The legumes were with higher values for protein content; it is between 14.6 to 18.8%, indicates suitability of pressed materials in animal nutrition. The CF varied within a wide limit of 25 to 41% where in pressed materials was with higher values of fiber. All silage samples contents other nutrients except calcium (Ca) in appreciable quantity for animal feeding.

The overall results suggested that on the basis of pH values silages were not good but need of silage additives before ensilaging was recommended.

Bajra	Chopped	79.5	17.0	4.35	9.6	2.10	79.5
	Pulped	66.5	28.6	3.92	9.8	2.40	77.5
	Pressed	47.2	22.7	3.90	7.6	1.05	71.4
Cowpea	Chopped	87.5	33.5	5.74	8.4	1.05	80.0
	Pulped	93.8	88.2	4.94	8.4	1.10	80.5
	Pressed	68.4	44.4	4.85	7.6	1.00	77.0
Dolichos	Chopped	61.6	58.2	4.64	8.6	0.95	74.5
	Pulped	69.3	97.3	4.60	8.8	1.00	75.8
	Pressed	48.8	66.6	4.62	8.2	0.65	71.3
Bajra + Cowpea	Chopped	71.6	35.0	5.54	7.0	0.85	79.4
	Pulped	80.7	94.3	4.74	7.4	1.00	78.8
	Pressed	48.2	75.7	4.70	5.2	1.05	72.0
Bajra +Dolichos	Chopped	68.1	44.3	5.35	6.8	1.10	76.5
	Pulped	75.0	68.0	4.59	7.2	1.15	75.0
	Pressed	45.6	66.5	4.86	6.2	1.00	69.3
Cowpea +Dolichos	Chopped	76.9	61.5	5.84	2.6	1.15	80.5
	Pulped	88.1	68.1	5.02	3.2	1.40	79.0
	Pressed	44.4	43.7	5.02	2.6	1.00	73.0

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