

## Forage Productivity of Para Grass on Reclaimed Wastelands

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### Abstract

Present investigations were carried out during 2008- 2009 at Gajulamandyam village lands, Renigunta Mandal, Andhra Pradesh, India, to study the forage productivity of para grass on reclaimed alkaline waste lands. The comprehensive study of the plant growth showed that there is considerable improvement in the yield of forage grass. The detailed study was also done for analysis of proximate composition for para-grass for all stages.

**Key words:** Reclaimed soil, Para grass, proximate composition.

### Introduction

Present investigations were carried out during 2008- 2009 at Gajulamandyam village lands, Renigunta Mandal, Andhra Pradesh, India, to study the forage productivity of para grass on reclaimed alkaline waste lands.

Para grass (*Brachiaria mutica*), grows well in most of the tropical countries. The para grass is a nutritious high yielding and palatable forage grass. The grass appears to be free of any toxic effect. It's a summer perennial grass. Adapted to high-rainfall in tropical and subtropical conditions, but in protected areas it can persist with rainfall as low as 900 mm per year. It usually tolerates general drought by reason of its specific swampy environment, being maintained by the residual moisture from the wet season. It prefers alluvial and hydromorphic soils but will grow on a wide range of moist soil types. The competitive vigour of para grass interferes with the co-existence of legumes. The first harvest takes about 2-3 months after planting when the grass attains a height of about 60 to 70 cms. Subsequent cuts are taken at 50 to 60 days interval.

The present study was done on Para grass growth on reclaimed alkaline soils.

### Literature Review

**Garcia and Garcia(1976)** studied the effect of three different growth stages during two growing stages on ten pasture plants including medicago sativa and trifolium protange. **Joshi and Upadhyaya (1976)** reported the crude protein 6.9 and crude fiber 30.5 % in the hay of paragrass. They showed that the hay could supply sufficient energy, protein and minerals for maintenance of sheep on voluntary intake. **Wanpat et al( 1989)** reported the nutritive value of cowpea, 27 cultivars were harvested at pod maturity when approximately 50% leaf matter was green, leaf and stem CP contents were 8 and 14.3% of DM, respectively, correspondingly acid detergents lignin values were 8.0 and 7.2 % and in vitro digestible DM was 67.3 and 63.7%.

### Materials and Methods

Experiments were conducted during 2007-2008 at Gajulamandyam village lands, Renigunta mandal, Andhra Pradesh, India.

#### Adopted methodology

- (1) Around 20X20 sq.mt area of reclaimed land taken for trail for study.
- (2) Land prepared by ploughed two to three times and removed all weeds.
- (3) Planted two varieties of para-grass slips planted in that area as 50 to 60 cm apart both ways between plants and rows on basis of 35000 slips per hectare. Selected para-grass varieties are Indian Para-grass (IPG) and Vietnam Para-grass (VPG).
- (4) Stem cuttings or pieces of creeping shoots 15 to 30 cm long with about three joints are generally planted in a slanting position.
- (5) First light irrigation done on land with fresh bore-well water.
- (6) Without addition of any manure or fertilizers observed the growth of para grass of two varieties.
- (7) Every 10 days once irrigation done on trail land.
- (8) First harvest taken after 60 days and at height of 90 cms. And noted the total yield on as such basis and dry basis also. Plant analysis made on possible parameters.
- (9) Subsequent cutting taken on every 60 days.
- (10) Annual yield calculated and analyzed for all chemical parameters.

### Results and Discussion

Table 01 shows the schedule of plant samples collected for analysis.

**Table 01:** Fodder samples collected as per below schedule.

Fodder	Growth stage/ Cutting intervals( <sup>th</sup> day)			
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>
Indian Para Grass	90	180	270	360
Vietnam Para Grass	90	180	270	360

Following test were done for plant samplings.

**Proximate Composition**

1. Dry Matter (DM)
2. Crude Protein (CP)
3. Ether Extract (EE)
4. Crude Fibre (CF)
5. Total Ash

Table 02 shows the characteristics of reclaimed alkaline wasteland.

**Table 02:** Characteristics of Reclaimed Soil.

Parameter	Units	Value
pH	SU	7.81
EC	Mmhos/cm	2.58
OC		Medium
Macro Nutrients		
N	Kg/ha	589
P	Kg/ha	34.72
K	Kg/ha	706
Secondary Nutrient values		
Na <sup>+</sup>	Ppm	181
Ca <sup>+</sup>	Ppm	55
Mg	Ppm	107
Micro Nutrients values		
Zn	Ppm	2.33
Mn	Ppm	4.29
Fe	Ppm	3.01
Cu	Ppm	0.51

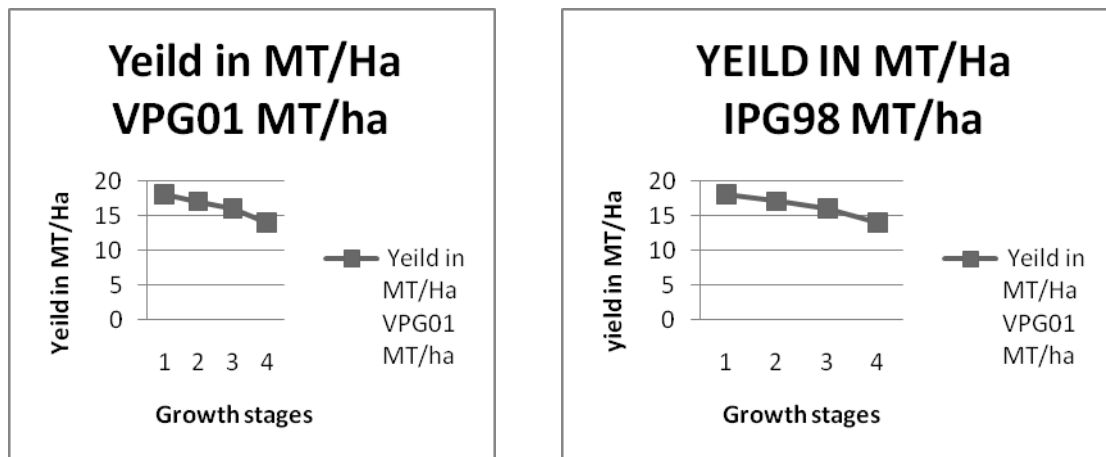
Table 03 shows the yield obtained from trail lands in Metric Tonne per hectare basis in all stage growth cuttings.

**Table 03:** Yield (MT/Ha) Para-grass yield quantity measured in MT/Ha basis for all stage growths and yield data given in below table.

Growth stage	IPG98 *(MT/Ha)	VPG01 *(MT/Ha)	Normal yield on fertile soils in (MT/Ha)
First cutting 90 days	18	17	19
Second cutting 90days	17	17	19
Second cutting 90days	16	17	17
Second cutting 90days	14	16	15
Total MT/Ha / Annum	65	67	70

\*Yield was calculated as total weight in MT /hector basis of grass on each cutting last day.

1. Total grass weight taken on 90<sup>th</sup> day for first cutting.
2. Again grass weight taken on 180<sup>th</sup> day for second cutting.
3. Again grass weight taken on 270<sup>th</sup> day for third cutting.
4. And again grass weight taken on 360<sup>th</sup> day for fourth cutting.



**Figure 01:** Shows the graphical presentation of yield obtained in MT/ha in all cuttings

- (1) It is highly observed that High yield obtained in first cutting comparing to other three cuttings.
- (2) In IPG98 yield is almost in decrease in trend and in VPG01 almost same pattern throughout the year.

- (3) With IPG98 variety annual yield is 65 MT/ha and with VPG01 the yield is around 67 MT/ha and it is less comparing that of in fertile land.

**FORAGE GRASSES ON RECLAIMED SOIL**



**Figure 02:** Para grass growth on reclaimed soil.

The following chemical analysis was done for para-grass samples at

**Proximate Composition**

Proximate composition of both varieties of paragrass at different growth stages has been shown below.

**Dry Matter %**

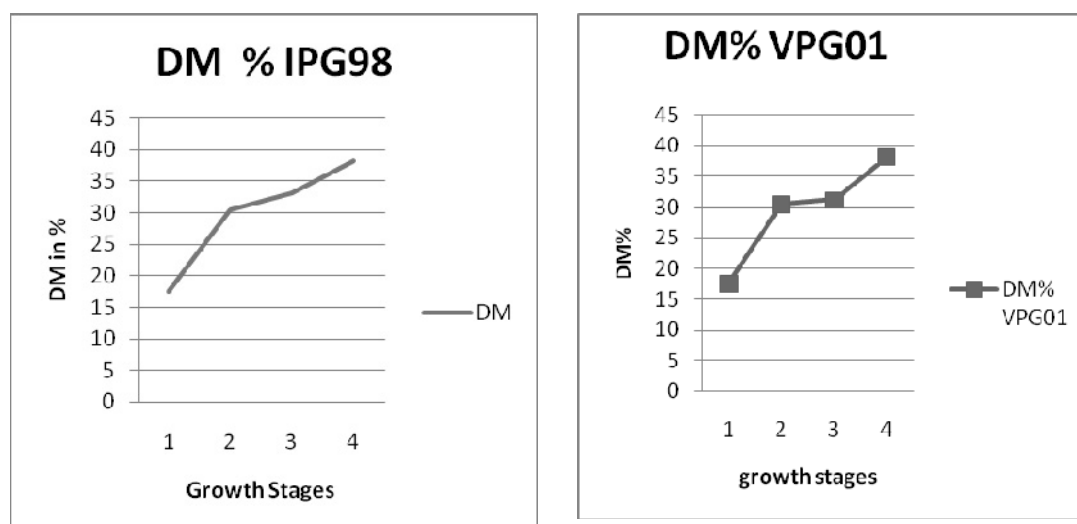
Table 04 shows the results of Dry Matter analysis for Para-grass.all four stages.

**Table 04:** Dry matter analysis.

Sample	IPG098	VPG01	Remarks
Cutting-1	17.47	17.52	
Cutting-2	30.40	30.47	
Cutting-3	33.10	31.15	
Cutting-4	38.14	38.18	

- (1) It is observed that dry matter content abnormally increase from 17.47 to 38.14 in PG98 and subsequently from 17.52 to 38.18 in VPG01.
- (2) It is the indication that moisture content been reduced from first cutting to final cutting in both varieties.

Graphical representation of Dry Matter content in Para- grass in both the varieties given in figure 3



**Figure 3:** Dry Matter Analysis.

### Crude Protein %

Table 5 shows the values of Crude Protein for Para -grass for all four stages.

**Table 5:** Crude Protein analysis.

Sample	IPG098	VPG01	Remarks
Cutting-1	13.27	13.23	
Cutting-2	13.50	13.48	
Cutting-3	9.16	9.14	
Cutting-4	9.14	9.14	

(1) It is highly observed that Crude protein value reduced from 13.27 to 9.14 from first cutting to fourth cutting in both IPG98 and VPG01 varieties.

Graphical representation of Crude Protein content in Para- grass in both the varieties given in Figure 4. Crude Protein analysis

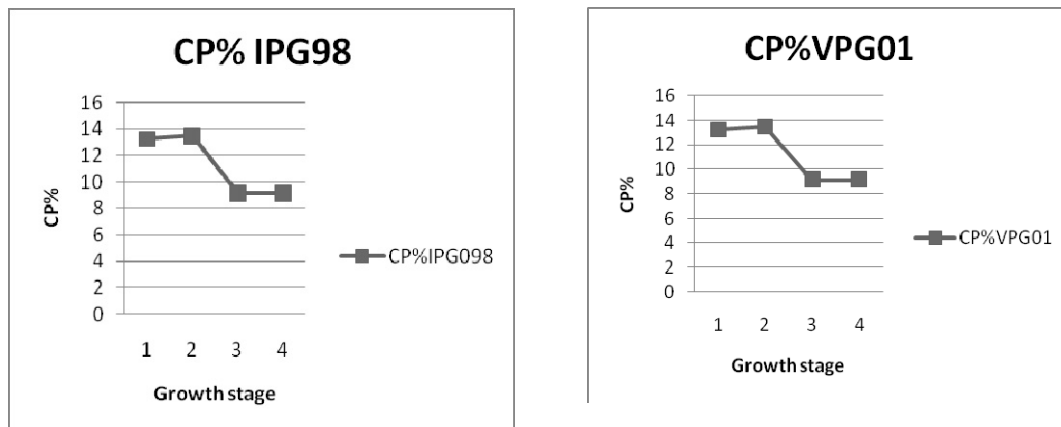


Figure 4: Crude Protein analysis.

**Crude Fiber%**

Table 6 shows the values of Crude Fibre for Para -grass for all four stages.

**Table 6:** Crude Fibre analysis.

Sample	IPG098	VPG01	Remarks
Cutting-1	29.74	29.70	
Cutting-2	31,38	21.31	
Cutting-3	32,71	32.75	
Cutting-4	35.21	35.16	

It is observed that crude fibre value has been increased from 29.74 to 35.21 in IPG98 variety and also same pattern observed in VPG01 variety with difference of 29.70 to 35.16

Graphical representation of Crude Fibre content in Para- grass in both the varieties given in Figure 5.

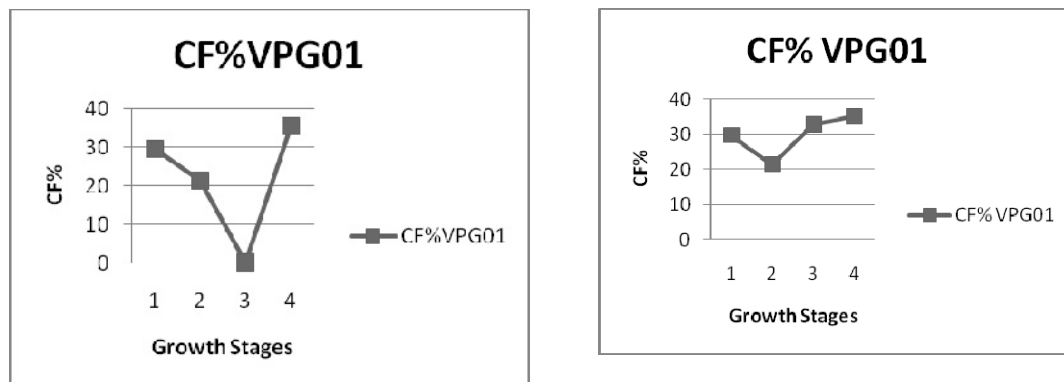


Figure 5: Crude Fibre.

**Ether Extract %**

Table 7 shows the values of Ether Extract for Para -grass for all four stages.

**Table 7:** Ether Extract Analysis.

Sample	IPG098	VPG01	Remarks
Cutting-1	3.43	3.47	
Cutting-2	2.84	2.90	
Cutting-3	2.80	2.86	
Cutting-4	2.73	2.76	

It is highly observed that EE value has been decreased in both the varieties ranges from 3.43 to 2.73 in IPG98 variety and 3.47 to 2.76 in VPG01 variety.

Graphical representation of Ether Extract content in Para- grass in both the varieties given in Figure 6

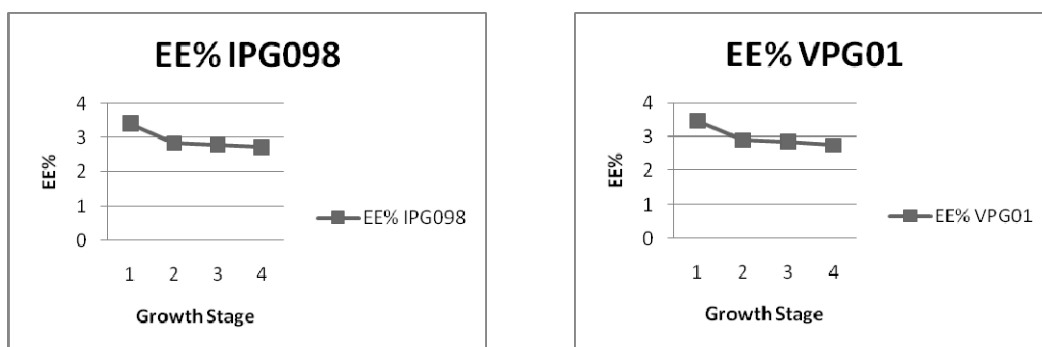
**Ash %**

Table 8 shows the Ash% for Para -grass all four stages.

**Table 8:** Ash Analysis.

Sample	IPG098	VPG01	Remarks
Cutting-1	12.38	12.42	
Cutting-2	9.91	9.97	
Cutting-3	8.83	8.9	
Cutting-4	7.70	7.77	

Graphical representation of Ash residue in Para- grass in both the varieties given in Figure 7.



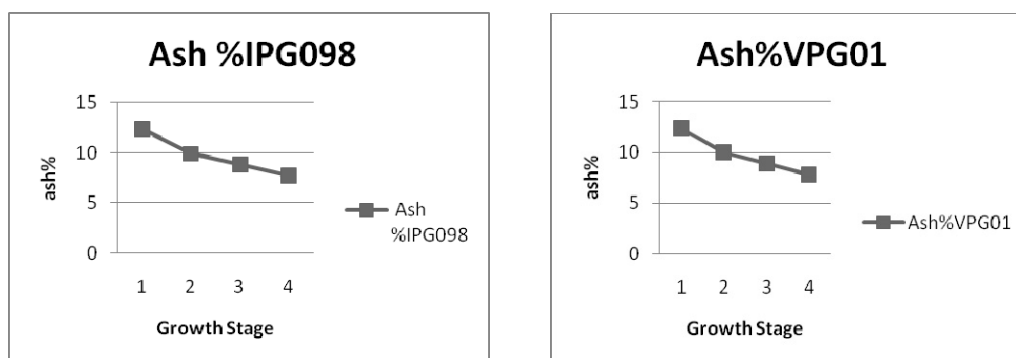


Figure 7: Ash%.

Ash content increased from 12.38 to 7.70 % in IPG98 and 12.42 to 7.77 %VPG 01 variety and down trend observed from first cutting to fourth cutting in both varieties.

## Conclusion

Advantages with this study is

- (a) Utilization of reclaimed soil for Para grass crop.
- (b) Para- grass gives immediate money returns to farmer by selling in lots.
- (c) Investment for these crops is very less and returns are guaranteed.
- (d) Loss on crop is very rear.
- (e) Improves the economic conditions of the farmer.
- (f) Live-stock growth takes place in that area.
- (g) Improves the GDP of the Nation by grass root level growth in the region.

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