

# UTILIZATION OF ORGANIC FERTILIZER ON GROWTH, PRODUCTION AND QUALITY OF *Brachiaria humidicola* AND *Pennisetum purpureum* UNDERNEATH COCONUTS BASED FARMING SYSTEM

*by Malcky Telleng13*

---

**Submission date:** 24-Feb-2023 02:54PM (UTC+0700)

**Submission ID:** 2021915869

**File name:** UTILIZATION\_OF\_ORGANIC\_FERTILIZER\_ON\_GROWTH\_PRODUCTION.pdf (218.59K)

**Word count:** 3103

**Character count:** 15991

## UTILIZATION OF ORGANIC FERTILIZER ON GROWTH, PRODUCTION AND QUALITY OF *Brachiaria humidicola* AND *Pennisetum purpureum* UNDERNEATH COCONUTS BASED FARMING SYSTEM

Selvie ANIS<sup>1</sup>, Charles KAUNANG<sup>1</sup>, Marie NAJOAN<sup>2</sup>, Malcky TELLENG<sup>1</sup>,  
Poulla WALELENG<sup>3</sup>

4

<sup>1</sup>Laboratory of Forages Science, Faculty of Animal Science, University of Sam Ratulangi Manado, North Sulawesi, Indonesia

<sup>2</sup>Laboratory of Animal Nutrition, Faculty of Animal Science, University of Sam Ratulangi Manado, North Sulawesi, Indonesia

<sup>3</sup>Laboratory of Social Economic, Faculty of Animal Science, University of Sam Ratulangi Manado, North Sulawesi, Indonesia

Corresponding author email: selvie\_anis@yahoo.com

### Abstract

Utilization of inorganic fertilizer is more simple but costly and has some negative environmental impact. Livestock manure is available abundantly and sometime promote soil and air contamination. The aims of this research was to studied the effects of organic fertilizer utilization on growth, production and quality of two common tropical grasses known as *Brachiaria humidicola* cv. Tully and *Pennisetum purpureum* cv. Mott grown underneath mature coconuts plantation. Treatments consisted of two kind of organic fertilizer called "bokashi" based on manure of chicken and ruminant fermented with effective microorganism (EM4). Treatments were put as factorial arrangement based on completely randomized design. The variables measured were dry matter production, quality of forages and predicted carrying capacity. Data was using ANOVA followed by HSD. The results shown all variable were significant higher of both kind of grasses with organic fertilizer at level of 20 tons ha<sup>-1</sup>. It could be concluded that both species of grasses response positively utilization of organic fertilizer bokashi, but in term of DM and CP content utilization of bokashi based on chicken manure fermented with effective micro-organisms EM4 was better than those of ruminant manure. Utilization of organic fertilizer in form of bokashi could provide forages to ruminant production integrated with coconuts plantation. By that way could be enhance economic value of this integrated systems.

**Key words:** fertilizer, quality, *B. humidicola*, *P. purpureum*, coconuts.

### INTRODUCTION

Indonesia is one of the among five country with big human population in the world, still import red meat to meet demand of this meat in country, since the price of this commodity is higher than those import. The problem is supply of forages is insufficient due to limitation of space for forage production. On the other hand there is some under utilize space in coconut plantation since Indonesia is the largest production of coconuts in the world. Furthermore, some tropical grasses have been selected as species tolerance growth under shade environment in coconuts plantation (Rumokoy et Toar, 2014). Dry matter (DM) production of *P. purpureum* including dwarf genotype is enhanced by high input of inorganic fertilizer (Hasyim et al., 2014), but

this increases the cost of forage production. Chemical fertilizer is widely used in agriculture. However, in recent years, serious concern has arisen about long-term adverse effects of continuous and indiscriminate use of chemical fertilizer in intensive agriculture on the deterioration of soil structure and function and environmental pollution (Farede et al., 2010). Livestock manure is an organic fertilizer that plays a key role in chemical and biological soil functions of intensively cropping fields under sustainable and environmentally harmonized herbage production. Since manure has a high concentration of organic matter, its application as a fertilizer helps decelerate depletion of organic matter in arable land, especially when there is a high frequency of heavy erosion (Prasad et al., 2002). It also increases the soil levels of the macro elements

of nitrogen (N), phosphorus (P), and potassium (K) (Kaligis et al., 2013; Kaligis et al., 2012). Improves soil physical properties, enhances DM yield, and improves the crude protein concentration of herbages (Kaligis et al., 2017). Utilization of in-organic fertilizer for forages production is costly for smallholder farmers and risks environmental pollution by rapid nutrient leaching under heavy rainfall. On the other hand organic manure application has lower risk of nutrient leaching by mineralization than compared with chemical fertilizer input. The objectives of this research were to study the effects organic fertilizer application on growth, yield and estimated carrying capacity of two tropical grasses grown integrated in coconut based farming system.

## 15 MATERIALS AND METHODS

The plant material used in this study was tillers of both species. Tiller was put in individual poly bags (1 plant/poly bag) which were filled with 2 kg growing media. The plants were nursed for 3 months in growing media. After 3 months of the nursery period, these plants has been trimming to get homogeny re-growth, then were transplanted to experimental plot in the field since February 2017 until August 2017. Experimental site receives an average rainfall of 2700 mm, and the distribution fairly even, except for the period of lower rainfall by 100-150 mm monthly, from July to September. The pH of the fertile, sandy loam soil is around 6. Light transmission at 10.00 am on a sunny day as PAR underneath mature tall coconuts averaged 73%. The soil has an average pH of 6 and its color was dark brown clay. Precipitation peaks took place in January, with high rainfall intensity. This caused high relative humidity (80%). Air temperature ranged from 25°C to 37°C. The *P. purpureum* cv. Mott grass plant space was 100 x 100 cm apart and *B. humidicola* space was 50 x 50 cm apart. This experiment using completely randomized factorial design with 2 factors. Treatments consisted of different level of two kind of organic fertilizer called "bokashi" based on chicken and ruminant manure fermented with effective microorganism (EM4). The first factor was two species of grasses being evaluated were *B. humidicola* cv. Tully and *P. purpureum* cv.

Mott. The second factor was two sources of bokashi based on chicken manure (bokashi-1) and ruminant manure (bokashi-2), Three different levels of bokashi applications (B) where B1 = 5 tons, B2 = 10 tons, and B3 = 20 tons ha<sup>-1</sup>. Each treatment was allocated randomly at experimental plots in the field. The variables include fresh weight yield (tons/ha), dry weight yield (tons), crude protein, crude fiber and ash content. Dry matter yield of each plot was calculated through the value of green forage production and dry-weight percentage. Combining the dry matter yield with crude protein, crude fiber, and ash content data allowed us to calculate the mean crude protein, crude fiber, and ash yield. Predicted carrying capacity was determined by the information obtained from the forage harvested; it was collected from productivity estimation of each plot and converted to one ha. Available forage was calculated based on 70% of the total used factor. It is assumed that animal consumes 6.29 kg DM of forage/day/head (Indonesian condition). The plot size was 10 x 10 m. The total number of plots was 60 consisting of both grasses x 2 sources of bokashi x 3 level of bokashi x 5 replications. Data were then statistically analyzed by using analysis of variance (ANOVA) by means of MINITAB (Version 16). Honestly Significance Difference (HSD) was applied to determine the difference among treatments. Differences were considered at P<0.05. Harvesting biomass of *B. humidicola* cv. Tully and *P. purpureum* cv. Mott was done simultaneously when the ages of plants has arrived 35 days after replanting time in the field. *P. purpureum* cv. Mott was defoliated at first node from the soil surface (approximately 10 cm above ground). *B. humidicola* was defoliated at 10 cm level above ground. To get sample of *B. humidicola* has been used square 1 x 1 meter. This square was placed two time in the middle of each plot to avoid the border effects. Sample of *P. purpureum* has take five plants in two difference places in each plot so there were 10 plants as sample in each plot. Sample was dried at 60°C for about 48 h to determine the dry weight. The samples were analyzed for dry matter, crude protein, crude fiber and ash according to the standard procedure of Association of Official Analytical Chemists.

## RESULTS AND DISCUSSION

The effect of treatments on quality of grasses has been measured (Table 1). Data showed the effects of application both types of bokashi at

20 tons ha<sup>-1</sup> produced dry matter (DM) content of both grasses significantly higher compared to other level.

25  
Table 1. Dry matter (DM), crude protein (CP), NDF and ash content of both grasses under different kind and levels of bokashi

| Attribute (%) | Treatments<br>(bokashi tons.ha <sup>-1</sup> ) | Treatment          |                    |                    |                    |
|---------------|--|--------------------|--------------------|--------------------|--------------------|
|               |  | Bokashi-1          |                    | Bokashi-2          |                    |
|               |  | Bh                 | Pp                 | Bh                 | Pp                 |
| DM            | 5  | 16.75 <sup>b</sup> | 24.01 <sup>b</sup> | 15.71 <sup>b</sup> | 20.01 <sup>b</sup> |
|               | 10   | 17.32 <sup>b</sup> | 24.35 <sup>b</sup> | 16.82 <sup>b</sup> | 19.15 <sup>b</sup> |
|               | 20   | 17.61 <sup>a</sup> | 28.72 <sup>a</sup> | 18.51 <sup>a</sup> | 23.22 <sup>a</sup> |
|               | Significant                                    | *                  | *                  | *                  | *                  |
|               |  |                    | 17.23 <sup>b</sup> | 25.69 <sup>a</sup> | 17.01 <sup>b</sup> |
|               |  | 21.46 <sup>a</sup> |                    | 18.90 <sup>b</sup> |                    |
| CP            | 5  | 10.73              | 9.03               | 9.75               | 8.05               |
|               | 10   | 11.31              | 9.71               | 11.01              | 9.11               |
|               | 20   | 11.47              | 10.13              | 12.07              | 11.13              |
|               | Significant                                    | NS                 | NS                 | NS                 | NS                 |
|               |  |                    | 11.17 <sup>a</sup> | 9.62 <sup>b</sup>  | 10.94              |
|               |  | 10.39              |                    | 10.18              |                    |
| NDF           | 5  | 66.31              | 68.53              | 63.31              | 67.63              |
|               | 10   | 65.17              | 67.71              | 64.16              | 65.71              |
|               | 20   | 65.87              | 67.54              | 66.77              | 66.14              |
|               | Significant                                    | NS                 | NS                 | NS                 | NS                 |
|               |  |                    | 65.78              | 67.93              | 64.75              |
|               |  | 66.85              |                    | 65.62              |                    |
| Ash           | 5  | 11.04              | 11.20              | 10.84              | 10.70              |
|               | 10   | 10.15              | 10.76              | 10.35              | 11.16              |
|               | 20   | 10.27              | 11.32              | 10.23              | 10.52              |
|               | Significant                                    | NS                 | NS                 | NS                 | NS                 |
|               |  |                    | 10.49              | 11.09              | 10.47              |
|               |  | 10.79              |                    | 10.60              |                    |

Note: Bh= *B. humidicola* cv. Tully; Pp = *P. purpureum* cv. M. 5 NDF=Neutral Detergent Fiber; NS = Non Significant Difference. Symbols with different letters were significantly different among treatments by the least significant difference (LSD) method at the 5% level

There were not significantly effects of treatment on all attributes (27) quality of forages in this research, in term of crude protein (CP), neutral detergent fiber (NDF) and Ash.

In general CP content of both species was also high enough for quality feeding above the minimum level required to fulfill the needs of functioning of rumen microbes (Van Soest, 1994). Even though, CP content of *B. humidicola* (11.17%) with bokashi-1 application was significant higher than *P. purpureum* (9.62%). More over DM content of both grasses was significant higher effected by bokashi-1 (21.46%) than bokashi-2 (18.90%). Growth attribute in term of plant height, number of tiller and ground cover has been measured (Table 2).

Data showed growth attributes of plant height did not different significantly on *P. purpureum*

(Pp) except application of both type of bokashi at 20 tons ha<sup>-1</sup> plant height has significant higher compared to other levels, but among them bokashi-1 has significant higher of plant height than bokashi-2.

The effects of treatment on number of tiller of Pp grass in each plant sample or mother plant (MP) was significantly higher at 20 tons of both type of bokashi application than other levels, and again bokashi-1 showed significant higher number of tiller than the other type. Tiller number increase was consistent with seasonal changes in this attribute with the progression of cutting practice (Hasyim et al., 2014). There was no determine these variable to *Brachiaria* (Bh) since it has growth habits as prostrate species, but there was ground cover information of this species which is did not different significantly among treatments.

Table 2. Plant height and number of tiller of *P. purpureum* cv. Mott

| Variable                             | Treatments<br>(bokashi tons.ha <sup>-1</sup> ) | Treatment |                    |           |                    |
|--------------------------------------|--|-----------|--------------------|-----------|--------------------|
|                                      |  | Bokashi-1 |                    | Bokashi-2 |                    |
|                                      |  | Bh        | Pp                 | Bh        | Pp                 |
| Plant height (cm)                    | 5  | –         | 130 <sup>b</sup>   | --        | 120 <sup>c</sup>   |
|                                      | 10   | –         | 130 <sup>b</sup>   | --        | 133 <sup>b</sup>   |
|                                      | 20   | –         | 162 <sup>a</sup>   | --        | 150 <sup>a</sup>   |
|                                      | Significant                                    |           | *                  |           | *                  |
| Number of tiller (MP <sup>-1</sup> ) | 5  |           | 140.6 <sup>a</sup> |           | 134.3 <sup>b</sup> |
|                                      | 10   | –         | 19 <sup>c</sup>    | --        | 15 <sup>c</sup>    |
|                                      | 20   | –         | 24 <sup>b</sup>    | --        | 19 <sup>b</sup>    |
|                                      | Significant                                    |           | *                  |           | *                  |
| Ground cover (% M <sup>-2</sup> )    | 5  |           | 26.00 <sup>a</sup> |           | 20.67 <sup>b</sup> |
|                                      | 10   | 70        | –                  | 73        | --                 |
|                                      | 20   | 75        | –                  | 76        | --                 |
|                                      | Significant                                    |           | NS                 |           | NS                 |
|                                      |  | 76.66     | --                 | 76.33     |                    |

Note: Bh= *Brachiaria humidicola* cv. Tully; Pp = *Pennisetum purpureum* cv. Mott; NDF=Neutral Detergent Fiber; NS = Non Significant Difference; MP = mother plant; M<sup>-2</sup>= meter square. Symbols with different letters were significantly different among treatments in each harvesting time by the least significant difference (LSD) method at the 5% level.

Table 3. Dry matter (DM) Crude protein (CP), Neutral Detergent Fiber (NDF) yield and predicted of carrying capacity (CC) of both grasses

| Variable                      | Treatments<br>(bokashi tons ha <sup>-1</sup> ) | Treatment          |                    |                    |                    |
|-------------------------------|--|--------------------|--------------------|--------------------|--------------------|
|                               |  | Bokashi-1          |                    | Bokashi-1          |                    |
|                               |  | Bh                 | Pp                 | Bh                 | Pp                 |
| DM (tons ha <sup>-1</sup> )   | 5  | 3.15 <sup>b</sup>  | 14.11 <sup>b</sup> | 2.95 <sup>b</sup>  | 13.41 <sup>b</sup> |
|                               | 10   | 4.10 <sup>a</sup>  | 15.19 <sup>b</sup> | 4.02 <sup>a</sup>  | 14.79 <sup>b</sup> |
|                               | 20   | 4.25 <sup>a</sup>  | 17.75 <sup>a</sup> | 4.15 <sup>a</sup>  | 17.05 <sup>a</sup> |
|                               | Significant                                    |                    | *                  | *                  | *                  |
| CP (tons ha <sup>-1</sup> )   | 5  | 0.320 <sup>c</sup> | 1.017 <sup>c</sup> | 0.310 <sup>c</sup> | 1.210 <sup>c</sup> |
|                               | 10   | 0.361 <sup>b</sup> | 1.235 <sup>b</sup> | 0.343 <sup>b</sup> | 1.305 <sup>b</sup> |
|                               | 20   | 0.407 <sup>a</sup> | 1.419 <sup>a</sup> | 0.411 <sup>a</sup> | 1.381 <sup>a</sup> |
|                               | Significant                                    |                    | *                  | *                  | *                  |
| NDF (tons ha <sup>-1</sup> )  | 5  | 1.895 <sup>c</sup> | 8.275 <sup>b</sup> | 1.791 <sup>c</sup> | 7.775 <sup>b</sup> |
|                               | 10   | 2.031 <sup>b</sup> | 8.316 <sup>b</sup> | 1.931 <sup>b</sup> | 8.216 <sup>b</sup> |
|                               | 20   | 2.153 <sup>a</sup> | 9.854 <sup>a</sup> | 2.055 <sup>a</sup> | 9.354 <sup>a</sup> |
|                               | Significant                                    |                    | *                  | *                  | *                  |
| CC (head year <sup>-1</sup> ) | 5  | 5.09 <sup>b</sup>  | 18.31 <sup>c</sup> | 4.89 <sup>b</sup>  | 17.31 <sup>c</sup> |
|                               | 10   | 5.35 <sup>a</sup>  | 19.98 <sup>b</sup> | 5.05 <sup>a</sup>  | 19.08 <sup>b</sup> |
|                               | 20   | 5.47 <sup>a</sup>  | 24.34 <sup>a</sup> | 5.23 <sup>a</sup>  | 23.39 <sup>a</sup> |
|                               | Significant                                    |                    | *                  | *                  | *                  |
|                               |  | 5.303              | 20.87              | 5.05               | 19.92              |
|                               |  | 13.08              |                    | 12.48              |                    |

Note: Bh = *B. humidicola* cv. Tully; Pp = *P. purpureum* cv. Mott; NDF = Neutral Detergent Fiber; NS = Non Significant Difference; CC = carrying capacity. Symbols with different letters were significantly different among treatments by the least significant difference (LSD) method at the 5% level.

Presumably this species grown with aggressively root development after defoliation (Anis et al., 2011; Anis et al., 2015) and produced abundant tiller (Kaligis et al., 2013) and persist under free grazing (Kaligis et al., 2012). Yield and predicted of carrying capacity

has been measured in this experiment (Table 3). Data showed both species of grasses which were received both type of bokashi application at 20 tons ha<sup>-1</sup> produced all variable measured yield of DM, CP, NDF and predicted CC significant higher compared to other level.

High yield was presumably achieved due to increased nutrient absorption capacity release from organic fertilizer (Utamy et al., 2018). Efficiencies used of nitrogen in soil by chemical compound released called *brachialactone* through root exudate of *B. humidicola* (Subarao et al., 2009) and of a high density of roots under regularly defoliated of this species (Anis et al., 2012; Anis et al., 2015) and the ability adaptation of *P.purpureum* (Utamy et al., 2011; Utamy et al., 2018) due to improved soil physical properties (Fukagawa et al., 2000) and continuous nutrient absorption from earlier manure input. (Farede et al., 2010)

## CONCLUSIONS

It could be concluded that both species of grasses response positively utilization of organic fertilizer bokashi, but in term of DM and CP content utilization of bokashi based on chicken manure fermented with effective micro-organisms EM4 was better than those of ruminant manure. Utilization of organic fertilizer in form of bokashi could provide forages to ruminant production integrated with coconuts plantation. By that way could be enhance economic value of this integrated systems.

## ACKNOWLEDGEMENTS

We wish to thank to the Minister of Research, Technology and Higher Education Republic of Indonesia, for the financial support of this research through the Rector of the University of Sam Ratulangi Manado. We would also like to express appreciate to the Assessment Institute Agriculture Technology (AIAT) of North Sulawesi for the permission used the land of experimental station.

## REFERENCES

Anis, S.D., Chozin, M.A., Soedarmadi, Ghulamahdi, M., Sudradjat (2011). The effects of cutting height And interval of defoliation on productivity and nutrient content of *Brachiaria humidicola* (Rendle) Schweick. *J. Agron. Indonesia*, XXXIX(3), 217-222.

Anis, S.D. (2012). *Kajian tentang persistensi Brachiaria humidicola setelah digembalai pada lahan pertanian berbasis kelapa (Assesment of persistensi of Brachiaria humidicola after grazing in coconut plantation based farming)*. Desertation of Doctorat Degree, Bogor Institute of Agriculture (IPB), Bogor, Indonesia.

Anis, S.D., Kaligis, D.A, Pangemanan, S. (2015). Integration of cattle and koronivia grass pasture underneath mature coconuts in North Sulawesi, Indonesia. *J. Livestock Research for Rural Development* 10(RD), 27.

Fukagawa, S., Ito, K., Ishii, Y. (2000). Changes in respiratory activity and dry matter disappearance with aging Napiergrass (*Pennisetum purpureum* Schumacher). *Jpn. J. Grassl. Sci.*, 46, 167-174. (In Japanese).

Fadare, D.A., Bamiro, O.A., Oni, A.O. (2010). Energy and cost analysis of organic fertilizer production in Nigeria. *Energy*, 35, 332-340.

Hasyim, H., Ishii, Y., Wadi, A., Idota, S. (2014). Effect of digested effluent of manure on soil nutrient content and production of dwarf Napier grass in southern Kyushu, Japan. *J. Agron.*, 13, 1-11.

Kaligis, D.A., Anis, S.D. (2012). Long term evaluation of some tropical pasture under different grazing regime. *Journal Lucrari Stiintifice Serial Zootehnie*, 57 (17), 304-307.

Kaligis, D.A., Anis, S.D., Chosin, M. (2013). Characteristics and grazing pattern of *B.humidicola* cv. Tully underneath coconuts plantation. *Scientific Papers. Series D. Animal Science*, LVI, 28-85.

Kaligis, D.A., Anis, S.D., Waleleng, P., Oroh, F., Dalie, S. (2017). Utilization of signal grass pasture to support cattle production and economic value of coconut based farming. *International Conference of 6th Sustainable Animal Agriculture for Developing Contries*. The Singhasari Resort, Batu City, Indonesia.

Prasad, P.V.V., Satyanarayana, V., Murthy, V.R.K., Boote, K.J. (2002). Maximizing yields in rice-groundnut cropping sequence through integrated nutrient management. *Field Crops Res.*, 75, 9-21.

Rumokoy, L.J.M., Toar, W.L. (2014). The forage production of *Brachiaria mutica* under coconut tree canopy. *Lucrări Științifice - Universitatea de Științe Agricole și Medicină Veterinară, Seria Zootehnie*, 62, 12-134. [http://www.uaiasi.ro/zootehnie/Pdf/Pdf\\_Vol\\_62/LJM\\_Rumokoy.pdf](http://www.uaiasi.ro/zootehnie/Pdf/Pdf_Vol_62/LJM_Rumokoy.pdf)

Subbarao, V.G., Nakahara, T., Asciano, C.E., Berry, W.L., Ito, O. (2009). Evidence for biological nitrification inhibition in *Brachiaria humidicola* pasture. *Agricultural Sci.*, 106 (41), 17302-17307.

Utamy, R.F., Ishii, Y., Idota, S., Harada, N., Fukuyama, K. (2011). Adaptability of dwarf napier grass under cut-and-carry and grazing systems for smallholder beef farmers in southern Kyushu, Japan. *J. Warm Reg. Soc. Anim. Sci. Jpn.*, 54, 65-76.

Utamy, R.F., Yasuyuki, I., Sachiko, I., Khairani, L. (2018). Effect of Repeated Application of Manure on Herbage Yield, Quality and Wintering Ability during Cropping of Dwarf Napiergrass with Italian Ryegrass in Hilly Southern Kyushu, Japan. *Agronomy*, 8, 30; doi:10.3390/agronomy8030030www.mdpi.com/journal/agronomy.

Van Soest, P.J. (1994). *Nutritional Ecology of the Ruminants*, 2nd ed.; New York, USA: Comstock Publishing Associates of Cornell University Press, Ithaca, 1-476.

# UTILIZATION OF ORGANIC FERTILIZER ON GROWTH, PRODUCTION AND QUALITY OF *Brachiaria humidicola* AND *Pennisetum purpureum* UNDERNEATH COCONUTS BASED FARMING SYSTEM

## ORIGINALITY REPORT

18%

SIMILARITY INDEX

15%

INTERNET SOURCES

14%

PUBLICATIONS

%

STUDENT PAPERS

## PRIMARY SOURCES

- 1 "Sustainable Management of Nematodes in Agriculture, Vol.1: Organic Management", Springer Science and Business Media LLC, 2022  
Publication 1%
- 2 [iqqo.org](http://iqqo.org)  
Internet Source 1%
- 3 Temidayo Ayodeji Adeyemi, Samson Adewale Adeoye, Timilehin Julius Ogunyemi, Elijah Adetola Adedeji et al. "Comparisons of nutrient solutions from organic and chemical fertilizer sources on herbage yield and quality of hydroponically produced maize fodder", Journal of Plant Nutrition, 2020  
Publication 1%
- 4 [media.neliti.com](http://media.neliti.com)  
Internet Source 1%
- 5 [thescipub.com](http://thescipub.com)  
Internet Source 1%

|    |   |     |
|----|---|-----|
| 6  | <a href="http://www.cabi.org">www.cabi.org</a><br>Internet Source   | 1 % |
| 7  | Tesfay Atsbha, Zebrhe Teklay, Hagos Kidane, Solomon Wayu. "Participatory evaluation of improved pastureland interventions in Ayba pastureland, South Tigray: Implication for pastureland enhancement", Cogent Food & Agriculture, 2020<br>Publication | 1 % |
| 8  | Tortuero, F.. "Effects of dietary fiber sources on volatile fatty acid production, intestinal microflora and mineral balance in rabbits", Animal Feed Science and Technology, 199407<br>Publication   | 1 % |
| 9  | <a href="http://cgspace.cgiar.org">cgspace.cgiar.org</a><br>Internet Source   | 1 % |
| 10 | <a href="http://www.jstage.jst.go.jp">www.jstage.jst.go.jp</a><br>Internet Source   | 1 % |
| 11 | <a href="http://ctujsvn.ctu.edu.vn">ctujsvn.ctu.edu.vn</a><br>Internet Source   | 1 % |
| 12 | <a href="http://www.uaiasi.ro">www.uaiasi.ro</a><br>Internet Source   | 1 % |
| 13 | BALABANLI, Cahit, ALBAYRAK, Sebahattin and YUKSEL, Osman. "Effects of nitrogen, phosphorus and potassium fertilization on   | 1 % |



the quality and yield of native rangeland",  
Tarla Bitkileri Bilimi Derneği, 2010.

Publication

14

Citarsa, I B F, I N W Satiawan, I K Wiryajati,  
and Supriono. "Performance analysis of  
cascaded h-bridge multilevel inverter using  
mixed switching frequency with various dc-  
link voltages", IOP Conference Series  
Materials Science and Engineering, 2016.

Publication

1 %

15

pt.scribd.com  
Internet Source

1 %

16

medpub.litbang.pertanian.go.id  
Internet Source

1 %

17

Yasar Karadag, Ugur Buyukburc. "Forage  
qualities, forage yields and seed yields of  
some legume–triticale mixtures under  
rainfed conditions", Acta Agriculturae  
Scandinavica, Section B - Soil & Plant  
Science, 2004

Publication

1 %

18

eprints.undip.ac.id  
Internet Source

1 %

19

www.neliti.com  
Internet Source

<1 %

20

www.locus.ufv.br  
Internet Source

<1 %

21 Animesh Sarkar, Tofazzal Islam, Gokul Biswas, Shohidul Alam, Mikail Hossain, Nur Talukder. "Screening for phosphate solubilizing bacteria inhabiting the rhizoplane of rice grown in acidic soil in Bangladesh", *Acta Microbiologica et Immunologica Hungarica*, 2012  
Publication

---

22 [es.scribd.com](https://es.scribd.com)  
Internet Source

---

23 Florencia Nery Sompie, Jein Rinny Leke, Jacqueliem Laihad, Linda Tangkau, Malcky Telleng. "The effect dietary peanut flour (*Arachis hypogaea* L.) on the quality of chicken eggs", AIP Publishing, 2023  
Publication

---

24 F. Gao, Y. Jiang, G.H. Zhou, Z.K. Han. "The effects of xylanase supplementation on growth, digestion, circulating hormone and metabolite levels, immunity and gut microflora in cockerels fed on wheat-based diets", *British Poultry Science*, 2007  
Publication

---

25 [cwww.intechopen.com](https://cwww.intechopen.com)  
Internet Source

---

26 [pdfkul.com](https://pdfkul.com)  
Internet Source

---

27 [repositorio.bc.ufg.br](https://repositorio.bc.ufg.br)  
Internet Source

---

28

Mohamed Khodary, Ahmed Ahmed Sallam, Mohamed Balah. "Enhancement Imperata cylindrica (L.) chemical control with fluazifop-butyl and glyphosate using some additives", Journal of Sohag Agriscience (JSAS), 2022

Publication

&lt;1 %

29

[worldwidescience.org](http://worldwidescience.org)

Internet Source

&lt;1 %

30

Nina Antonia Cornelia Smits. "Repression of potential nitrification activities by matgrass sward species", Plant and Soil, 09/01/2010

Publication

&lt;1 %

31

Hadijah Hasyim, Yasuyuki Ishii, Ahmad Wadi, Sachiko Idota. "Quality Herbage Production of Dwarf Napiergrass with Italian Ryegrass Cropping under Digested Effluent Application in Southern Kyushu, Japan", American Journal of Agricultural and Biological Sciences, 2016

Publication

&lt;1 %

32

Mohammad Mijanur Rahman. "Effect of application form of nitrogen on oxalate accumulation and mineral uptake by napiergrass (Pennisetum purpureum) : Oxalate accumulation and mineral uptake", Grassland Science, 09/2010

Publication

&lt;1 %

---

Exclude quotes Off

Exclude matches Off

Exclude bibliography Off