Weeds optimally grow in peat swamp after burning

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Abstract: After clearing land by burning the peat, then the weeds and undergrowth will flourish. Even sometimes, the weeds are eventually burned again. Weed is known as a destroyer plant that has to be controlled. Through proper treatment, the existing weeds in peatlands can be potentially exploited. The purpose of this study was to determine the calorific value of briquettes as one of peatland weeds utilization. The results showed that the calorific value ranged from 2,492 cal/g to 5,230 cal/g. The lowest calorific value was on ‘teki kecil’ grass (Scirpus grossis Lf), while the highest calorific value was observed for ‘bantalaki’ grass (Hymenachne amplexicaulis Nees). The high calorific value of the peat weeds are potential for biomass briquettes raw materials. The utilization and use of peat weed briquettes as a raw materials expected can reduce land degradation due to peat swamp burning.

Keywords: briquettes, peat swamp, weeds utilization

Introduction

Fire is a frequent event in peat swamps. This event will increase in intensity during the dry season arrives. According to Akbar (2011), there are six factors that generate fire, i.e. (1) the damage of forest canopy structure that causes the forest susceptibility to heating, (2) the forest is open to the public resources and capabilities in the field of forestry officials to secure the forest is minimal so that everyone can take the forest without concerned with sustainability, (3) fire control system that has not been to involve forest communities, (4) forest fire caused by negligence increased the use of fire for farming, (5) fire control technology is not popular in the community, and (6) lack of proper silvicultural systems.

Community tend to choose burning activities to clear land, either for agriculture, farming, and plantation, were deemed to be more efficient and effective for the community. As a result of the combustion of very diverse acts, including the emergence of weeds or undergrowth. According Bastoni and Sianturi (2000), the fire has led to an anchorage burning peat layer tree roots, so plants thrive under. As stated by Najyati et al. (2005), due to the burning of land, then the land will be in the open condition so that the presence of lower plants such as grasses, ferns and shrubs and herbaceous pioneer more. Weeds growing on peat swamp with lush real potential to be managed. Appropriate measures and profitable should be a major concern that weeds are very abundant in number in peat swamps can be used as an alternative management of peat swamp itself (Susanti and Wahyuningtyas, 2011). Wahyuningtyas et al. (2012) said that some types of weeds and undergrowth are often found in peat swamps include: rumput paitan (Axonopus compresssus (Swartz) P. Beauv), ‘rumput gajah’ (Pennisetum purpureum Schumach.), ‘kelakai’ (Stenochlaena palustris Bedd. FERN), ‘gulma bunga kuning’ (Jussieua erecta Linn.), ‘pakis-pakisan’ (Blechnum indicum Burm.f.), ‘alang-alang’ (Imperata cylindrica (L.) Raesuschel), ‘purun tikus’ (Eleocharis ochrostachys Steud., ‘karamunting kodok’ (Melastoma malabathricum L.), ‘anggrek tanah bunga kuning’ (Philydrom lanuginosum Banks ex Gaertn.), eupatorium (Chromolaena odorata King & H. E Robins.), kalopogonium (Calopogonium mucunooides Desv.), ‘keladingan’ (Scleria purpurascens Steud.), ‘anggrek tanah’ (Xyris indica L.), ‘rumput bundung’ (Leersia hexandra Sw.).
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Weeds that have been dried, then charred, and mixed with sawdust and glue. Once mixed, put in a briquette mold, and dried in an oven with a temperature of 60 °C for 24 hours. Parameters observed in this study is the calorific value of briquettes, which performed at the Laboratory of Industrial Research and Standardization Banjarbaru.

Results and Discussion

Based on the results of laboratory analysis of the experiments that have been conducted, the calorific value of peat weeds briquettes, can be seen in Figure 1.

![Figure 1. Calorific Value of Peat Swamp Weeds Briquettes in (cal/gr)](https://example.com/figure1)

Based on the images shows that the calorific value ranging from 2,492 cal /gr - 5,230 cal /gr. The lowest calorific value is Teki Kecil grass (Scirpus grossus Lf), while the highest calorific value is bantalaki grass (Hymenachne amplexicaulis Nees). The high calorific value have so potential to be used as briquettes raw material.

Materials and Methods

The research method was an experimental on briquettes making. The briquettes were made from peat weeds. The materials used are weeds originating from peat and sawdust in the ratio 1 : 1. Coupled with adhesive material derived from starch.
Weeds optimally grow in peat swamp after burning

requires more briquettes calorific value of 4,000 cal/gram and qualified for charcoal timber briquettes standard quality SNI 01-6235-2000 which requires heating value should be more than 5000 cal/g (Sriharti et al. 2010). The calorific value generated by briquettes from organic material can be seen in Table 1 below:

Table 1. The calorific value of various biomass briquettes

| No  | Raw material     | Calorific value |
|-----|------------------|-----------------|
| 1   | Saw dust         | 4.600 cal/g     |
| 2   | Rice Husk        | 3.700 cal/g     |
| 3   | Cashew skin      | 6.148 cal/g     |
| 4   | Corncob          | 5.752 cal/g     |
| 5   | Water Hyacinth   | 3.332,65 cal/g  |

Source: Sinurat (2011), Maninder et al. (2012) and Utomo and Primastuti (2013)

The calorific value is very important to know, because it determines the ability of briquettes burning. The higher heating value, the higher the combustion capability. The heating value is the amount of heat obtained from the combustion of a fuel within a certain amount (Utomo and Primastuti, 2013). Jamilatun (2011) convey, is a measure of thermal or heat energy generated and measured as gross calorific value or net calorific value. So far, people are more familiar with coal briquettes as a potential raw material. But weed biomass and coal as a solid fuel which has different characteristics, because coal has a carbon content and high calorific value, ash content, and the content of volatile compounds were lower, while, biomass has a high volatile matter content but a low carbon content (Jamilatun, 2008). However, when seeing an average calorific value generated by peat weeds briquettes, these weeds briquettes have a potentially and dare to contend with briquettes from other raw materials. If the weeds that are growing in peat swamps can be used optimally, then the land degradation caused as a result of peat swamps burning activities during land clearing can be avoided.

Conclusion

Efforts to manufacture briquettes from peat weed is it can be used as an alternative energy source, and can help people to reduce the amount of peat weed burning. High calorific value of peat weeds briquettes showed the weeds potentiality as a biomass briquettes raw material. Weed management peat swamp appropriate because the amount and abundant availability will greatly help the community to improve the well-being and optimal environmental sustainability by reducing land degradation as a result of the act of burning the peat swamp.

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Weeds optimally grow in peat swamp after burning

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