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Converting Pineapple Field Waste into A Resource

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Every part of our society depends a great deal on energy and materials derived from finite resources. There have been attempts to use lesser energy in materials production and to find alternative renewable raw materials for either partial or total substitution. Natural fiber and starch are the two of renewable materials that have received a great deal of attention.

Pineapple plants are usually “knocked down” after every second or third fruit, before a new growing cycle begins. The residues left in the field are pineapple leaves and stems. Pineapple leaf is a source of high quality natural fiber while the stem contains bromelain and starchy material. Thus many different sustainable advantages could be gained if waste from this single source is fully utilized. However, before this can be achieved, appropriate related methods and management system have to be developed. Pineapple leaf fiber (PALF) has many potential applications. With

recently developed process, short and fine pineapple leaf fiber (PALF) can be extracted with high fiber yield as well as a large fraction of non-fibrous material (NFM). It will be shown that all parts of this single renewable source can be used as either as reinforcement or filler for the preparation of green polymer matrix composites with a wide range of adjustable properties. The fiber can be used in different forms and in a wide variety of matrices. The fine diameter fiber is also ideal as green support for the immobilization of enzymes, catalysts and ion chelating groups. Examples of potential applications will be reviewed and some specific results will be given.

Keywords: pineapple field waste, pineapple leaf waste; pineapple leaf fiber; green materials

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