

MANUALLY-OPERATED BIOMASS PELLETIZER FOR MAKING COCOPEAT PELLETS

by

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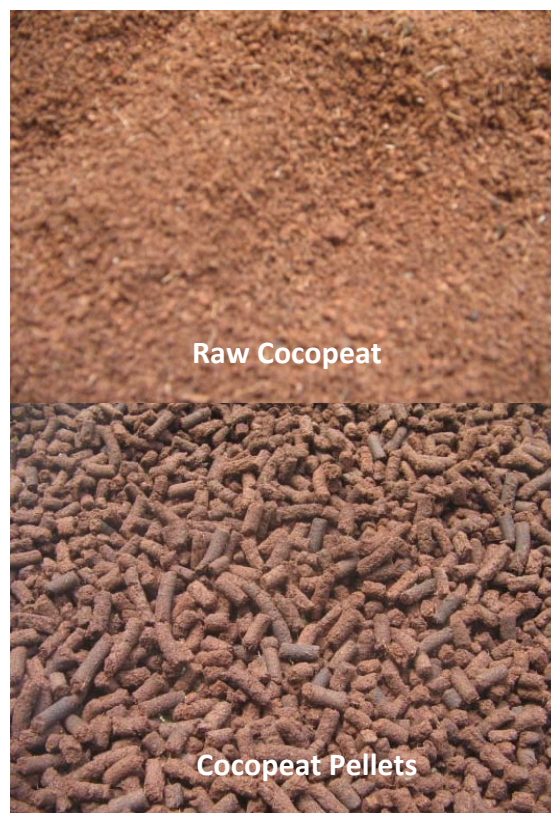
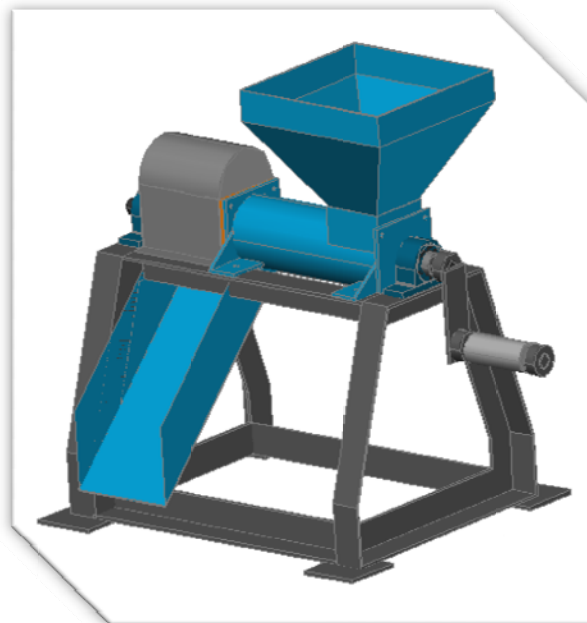
Good news!

Pelleting of biomass like cocopeat can now be done manually with the newly developed screw-press type pelletizer. This technology is another research and development breakthrough of the CPU Appropriate Technology Center in collaboration with PT Minang Jordanindo Approtech, and with the assistance from the agricultural engineering students Job Cordero, Ken Jornada, Ian Fabelle, Lucio Larano, and Ruel Hamor.

Cocopeat, which is difficult to use as fuel for domestic cooking, can now be made easily into pellets for convenient use of fuel for TLUD-type gasifier stove. Considering the production of cocopeat of about 2.8 million metric tons annually, this waste material can be a substantial source of heat energy for cooking and can be a good income-generating project for rural folks especially those in coconut-producing regions.

The manually operated biomass pelletizer, as shown above right, basically converts loose raw cocopeat into a solid cylindrical shape pellets using a binder. It consists of the following major components: (1) Feed Hopper, (2) Screw Press, (3) Plate Molder, (4) Discharge Chute, (5) Crank Handle, and (6) Support Frame. The feed hopper is where the raw cocopeat is fed for pelleting. The screw press, having a diameter of 10 cm and a length of 30 cm, compresses the raw cocopeat into a plate molder. The plate molder, with 10-mm ϕ - 90 holes, forms the material into a solid cylindrical shape pellets having a diameter of 6 mm (dry form) and varying length. The discharge chute is where the cocopeat pellets pass through for discharge.

The 50-cm long crank handle serves as a lever in driving the screw. And the support frame, made of angle bar, holds together the different parts in place.



Before pelletizing, cocopeat are passed through a screen with a hole size of 3/16 in. mesh. Gelatinized starch is mixed with the uniformly sized cocopeat material, having a ratio of 1:5 by volume. The mixture is then pelletized and pellet products are sundried for one and half days until they are dry and are ready for use as fuel. The machine can be operated by one person. It can produce cocopeat pellets at a rate of 8 g/rev or an average of 75 kg of cocopeat pellets in one day operation. The bulk density of wet and dry cocopeat pellets are measured at 860 and 200 kg/m³, respectively.



Loading of Mixture of Cocopeat and Gelatinized Starch in the Machine



Samples of Pelletized Cocopeat Coming Out of the Machine

The following are the advantage features of the machine: (a) Simple in construction, (b) Easy to operate and maintain, (c) Efficiently pelletizes cocopeat and other similar biomass material, (d) Can be operated either manually or using electric motor for a more uniform product and for a bigger output, (e) Product can be used practically as fuel for TLUD type gasifier stove, (f) Pellet size can be varied by changing the plate molder, (g) Low cost, and (h) Appropriate for home-industry use.



Sundrying of Pellets

The cost of the machine varies from P10,000.00 to P15,000.00 (US\$1 =PHP40), depending on the materials and methods of fabrication used. The investment for machine can be recovered within a year when pellets are used as fuel.

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