

Roof tile from oil palm solid waste

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KOTA KINABALU: Universiti Malaysia Sabah (UMS) has achieved another breakthrough in research – this time making a roof tile from oil palm solid waste.

Associate Professor of the university's Civil Engineering Programme Dr Mohamad Abdul Mannan said the so-called UMS roof tile comprised 70 per cent empty fruit bunch (EFB) and 30 per cent oil palm shell (OPS).

"The function of the UMS roof tile is better than the conventional clay and cement roof tile because its breaking load and impact resistance is high ... it won't break easily.

"Apart from that, during daytime this roof tile will not allow heat to pass through ... so it's more comfortable inside the house," he said.

Dr Mohamad said the UMS roof tile was easy to nail on purlin and was about 33 per cent lighter than clay or cement roof tile, thus being easier to handle.

"This product is also unique in that it is zero for both water absorption and permeability with no buckling effect," he said.

Mohamad said the UMS roof tile could last more than 10 years, depending on the quality of paint used.

"This UMS roof-tile needs painting and if the quality of the paint is good it can last long," he said.

Mohamad said the UMS roof tile could be produced easily without sophisticated equipment.

"It doesn't need highly-skilled labour either ... it can be produced even with ordinary workers. Besides that, it doesn't need much time to produce ... it only takes five minutes to produce one piece of the roof tile," he said.

For a small-scale production, machinery cost including that for cutting, mixing and pressing might reach RM100,000 with two production workers, he said.

"With this budget (RM100,000), we can produce 32 pieces (of UMS roof tile) per hour," he said.

He said based on a market survey, UMS roof tiles measuring 200mm x 400mm without paint would cost about RM7.50 per square metre while the retail price for clay roof tiles (300mm x 400mm) was RM49 to RM58.

"Cement roof tiles of the same size would cost about RM21 per square metre while metal roof sheets cost RM29 per square metre, he said.

Mohamad said he started doing research two years ago by taking samples of OPS and EFB from a Beaufort-based palm oil mill and a Kota Marudu palm oil mill.

The research findings would certainly help enhance the local construction industry produce high quality concrete, especially in terms of strength and durability.

It also underscored the importance of solid waste as a potential component in construction products, he said.

Mohamad said material recovery from conversion of agriculture and industrial solid waste into useful potential had not only environmental gains but it also preserved natural resources.

Malaysia produced more than half of the world's total output of palm oil from palms cultivated on 3.8 million hectares, he said.

"It also produces huge solid waste, namely oil palm shell (OPS) and empty fruit bunch (EFB), fronds, trunks, which remain unutilised commercially.

"One of the promising solutions of huge solid waste is to use in construction. As such, it has been tested in engineering properties, durability, and construction products made from OPS and EFB satisfy the requirement," he said.

Mohamad said the future of the UMS roof tile in the country, particularly in Sabah, was bright considering its low production cost and cheap raw material.

"On top of that, in Sabah, we have a large amount of oil palm solid waste which can be used for producing roof tiles ... raw material is not a problem," he said. –Bernama