

Thatches Catch No Fire

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TO minimise the risk of fire in villages, the Central Building Research Institute, Roorkee has developed a simple fire-retardant treatment for thatches. The Institute, has developed three methods for fire protection of thatch roofs. The first method, employing chemical impregnation followed by surface treatment was effective, but costly. A second method was developed based on a new technique of making rolls of reeds and fixing them on a bamboo frame for making thatch. Though this method was found satisfactory, it involves a non-conventional and more labour-consuming process due

A cut back (solution) is then prepared by mixing bitumen 80/100 grade and kerosene oil or diesel oil in the ratio 5 : 1.

For 1.8 Kg. cut back, 1.5 Kg. bitumen is melted and poured into a container having 300 ml. kerosene oil or diesel oil and stirred constantly till all the ingredients are mixed.

For every 1 cft of mud, 1.8 kg. cut back is added and mixed thoroughly by turning over the mud with spade and kneading it. This mud paste (mortar) is ready for plastering the thatch.

The thatched huts in the rural and slum areas are liable to be destroyed by fire as the thatching materials are highly combustible. The Central Building Research Institute, Roorkee has developed three methods for fire protection of thatched roofs. This article discusses one of the methods dealing with the preparation and application of fire-retardant and water-repellent thatch using only the conventional technique of making thatch roofs.

to which it could not be easily adopted in the field. The third method involves preparation and application of fire-retardant and water-repellent thatch using only the conventional technique of making thatch roofs.

Preparation of Thatch

A frame of bamboos of approximately 5 cm. diameter prepared by placing them across each other at about 30 cms. spacing. For a frame of half split bamboos of 5 cm. diameter approximately the spacing should be 15 cm. The frame is tied up with sutli or any other thin but strong string.

Reeds, rice paddy, coconut leaves or palmyrah leaves are evenly spread on the frame and tied up firmly with the help of a long needle in a conventional manner.

The thatch is mounted on mud walls or on wooden poles and tied with the structure at different points to hold it firmly.

About 1.8 Kg. of wheat straw or 5 cm. pieces of rice paddy is mixed with every one cft. of soil (from ponds) and kept wet for a week and kneaded daily. This ensures proper rotting of wheat straw or rice paddy and increases its workability.

It is applied on the top and bottom surface of the thatch with hand or trowel. The mud plaster on top and bottom surface should be 20 mm. to 25 mm., and 10 mm. thick respectively. It is then allowed to dry.

If, on drying some cracks are developed in the mud plaster these may be sealed off with the same bitumenized mud mortar.

Preparation and Application of gobar

One part of cow dung (gobar) is mixed with one part of soil by volume with sufficient water and mixed thoroughly to make a thin paste. Two coats of this thin paste are applied on top surface of dried mud plastered thatch and allowed to dry. It is necessary to apply the same gobar on the bottom surface of the mud plastered dried thatch in order to fill the cracks which are developed during the drying of the mud plaster. After this, two coats of water-proofing solution are applied as given below.

Water-proofing Treatment

To prepare a water proofing solution one part of hot melted bitumen is mixed with two parts of kerosene oil or diesel oil and stirred. A coat of this solution is applied by brush on the top surface of a thatch. It is allowed to dry for four hours and then another coat of the same solution is applied.

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The thatch roof thus made, is fire-retardant and water-repellent. To give a good appearance to the top surface of the thatch roof, which becomes black due to bitumen, a coat of ordinary gobri or white wash may be applied. For whitewashing the roof top, a quick lime emulsion is prepared with quick lime (One Kg.) and animal glue (70 gm.) dissolved in $\frac{1}{2}$ litre) boiled water. Quick lime is decanted or sieved and 14 per cent animal glue solution is added till brush consistency is achieved. If necessary more water can be added. Two coats of this lime wash emulsion are applied on the black surface of the roof.

Performance

Fire retardant and water-repellent thatches prepared as above were tested according to BS : 476-Part 3 in the External Fire Exposure Roof Test Apparatus. All the treated thatches (coconut, palmyrah, rice paddy, reeds etc.) are found to be in the Grade AA which implies that the thatches are safe at least for one hour of fire duration.

A model thatch of 9 sq. m. size was made and subjected to water spray test for a period of six months. It was found that no erosion and no leakage took place in the thatch.

The model thatches of all types i.e. palmyrah leaves, coconut leaves, rice paddy thatch, reeds thatch etc. were made fire-retardant and water-repellent. These thatches were subjected to natural weather test for the past three years. It has been observed that there is no leakage of water, no cracks are formed and the surface remains smooth. Thus the thatch treated as above

becomes not only fire-retardant but also water-repellent and there is no effect of wind too on the treated surface.

Advantages

The above techniques mitigate the fire risk and enhance the life of thatch to about 6 to 8 years. No skilled labour is required for this treatment. The total cost of this type of thatches works out to be approx. Rs. 18 per square metre.