PROTECTIVE TREATMENT OF FIRE PIPE HOSE AGAINST MICROBIAL DEGRADATION—PART II

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Fire Pipe hoses are liable to suffer heavy microbial damage under tropical conditions. Treatment with Mystox LPL 100% at 5% concentration has been found to confer effective protection.

Fire pipe hoses are highly susceptible to microbial degradation[1]. During use they remain soaked in water and invariably come in contact with soil. Both these factors provide ideal conditions for growth and activity of micro-organisms. To ensure their prolonged use it is necessary that the hose should be given an effective protective treatment against microbial degradation. Rose *et al*[2] have recommended the use of 2% Quindex (solubilized copper-8-quinolinclate containing 1·7% of copper) which was found to afford better protection than 12·5% copper naphthenate. Since this compound is imported and is liable to impart colour to the store, indigenous fungicides were evaluated to find out the most effective one

EXPERIMENTAL PROCEDURE

The treatment was carried out on Flax Fire Pipe Hose No. 8081, J.S.T., $2\frac{3}{4}''$: 24 ply, 10 RFT. Test specimens of $24'' \times 3''$ were used. Evaluation of various treatment was carried out by the soil burial technique[3]. The buried samples were incubated in the tropical room[4] of the laboratory to simulate natural conditions for the growth and activity of micro-organisms.

Preliminary investigations using 0·1%, 0·5% Srificide (a trade product of Sri Ram Institute, Delhi), 0·1%, 0·5% of Shirlan (Salicylanilide), 1·0% Antivermin (marketed by M/s. Kemi Colour Industries Ltd., Bombay) and 0·5% zinc naphthenate (zinc on the weight of the fabric) indicated that none of these treatments was effective. Higher concentration of Srificide, zinc naphthenate along with Mystox LPL 100% (pentachlorphenyl laurate) marketed by M/s. Sardesai and urea formaldehyde resin treatment[5] were tried. 12 replicates were taken for each treatment. 6 of these were subjected to leaching[6] by running water at the rate of 10 litres per hour for 24 hours. The samples were then dried in shade. These, along with the unleached samples, were put to soil burial test. After 28 days of incubation, the samples were dried in shade and their breaking strength determined. The percentage loss calculated on the basis of the average of 6 leached and 6 unleached replicates for each treatment is given in Table 1. No statistical analysis was done as the results were self explanatory.

RESULTS AND DISCUSSION

It is observed from Table I that treatment with 2% Srificide affords good protection but as the fire pipe hoses carry water at a very fast flowing rate, this treatment, which is highly leachable, is quite unsuitable. Zinc naphthenate, though quite effective in the concentration of 1·2% of zinc on the weight of the facbric, also shows a tendency towards leachability. Mystox LPL 100% appears to be quite effective in 5% concentration in white spirit when the samples are put in running water for 24 hours after treatment. This result was confirmed by repeating the experiment with fire hose as well as cotton dosooti and jute hessian. In every case the leached samples showed better resistance to micro-organisms than the unleached samples. It was, therefore, concluded that the

TABLE I

COMPARATIVE LOSS IN TENSILE STRENGTH OF THE FIRE HOSE WHEN SUBJECTED TO SOIL BURIAL TEST AFTER TREATMENT WITH VARIOUS FUNGICIDES

Treatment	Concentration	Leached/Unleached	Loss%	Remarks
Srifricide	2%	Leached	46	Highly leachable
		Unleached	5	
Zinc Naphthenate	0·8% Zinc	Leached	42	
		Unleached	24	Tendency towards leachability.
	1·2% Zinc	Leached	18	
		Unleached	11	
Urea Formaldehyde Resin Treatment	10°Tw	Leached	50	
		Unleached	47	
	12°Tw	Leached	37	Unleachable but renders the material stiff
		Unleached	35	
	14°Tw	Leached	27	
		Unleached	28	
Mistox LPL 100%	2%	Leached	65	
		Unleached	67	
	3%	Leached	34	Leaching has a fixative effect. The treatment becomes more effective after leaching.
		Unleached	49	
	4%	Leached	16	
		Unleached	25	
	5%	Leached	7	
		Unleached	11	
Untreated Control	NIL	..	..	..

samples after treatment with mystox LPL 100% (in any concentration) should first be dried in shade and then put into running water for 24 hours to have the fixative action. This further increases the resistance of the treated fabrics against microbial degradation.

Mystox LPL 100% which was being imported previously, is now manufactured in India by M/s. Sardesai Industrial Agencies (Private) Ltd., Bombay and is therefore available indigenously. Besides, Mystox LPL 100% is non-leachable and does not impart colour/odour to the store or stiffen the store thus making it inconvenient to handle. In view of the above treatment of hoses with Mystox LPL 100% is prefered to other fungicides.

CONCLUSION

Laboratory investigations show that neither zinc naphthenate nor urea formaldeyde resin treatment confer effective protection whereas Srifricide, though effective, is highly leachable. Except Mystox LPL 100% no other fungicide was found promising. Mystox LPL 100% at 5% concentration has been found to confer adequate resistance against microbial attack and rot as determined by soil burial tests. This compound has a peculiar property of becoming more effective after leaching. It will, therefore, be more suitable for treatment of fire hose pipes.

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