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**ALL INDIA NETWORK PROJECT ON RODENT CONTROL**  
**Central Arid Zone Research Institute, Jodhpur-342 003**

No. PC(RC)/Cons/LifelineTech Mumbai/2011  
Dated: 19.09.2011

To,  
Mr Rajan Raje  
Director  
M/S Life Line Technologies  
Plot No A-387, Road No 28, Ramnagar  
Wagle Estate, Thane- 400 604 (MS)

**Subject: Evaluation Report -Anti rodent testing of LDPE (Drip) Pipes with Rodent repellent master batch**

Sir,

In reference to your letter dated 19.07.2011, the LDPE (Drip) pipes with different treatments of anti rodent master batch were evaluated against three most common rodent species in our laboratory. The evaluation report of the same is enclosed herewith. We acknowledge with thanks the receipt of test fee.

Kindly acknowledge the receipt of the Report.

Yours sincerely

*R.S. Tripathi*

(R.S. Tripathi) 19.9.11

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Considering the distributional pattern and damaging propensities, these three species were exposed to the drip pipes under cage conditions in laboratory.

Before exposure, these rodents were kept hungry for 24 hours. Both the samples containing 1 and 2% anti rodent master batch (30 cm in length each) along with untreated control were separately exposed to individually caged test rodents. The trials were undertaken under no choice and choice conditions. Under no choice only test drip pipes were exposed to rodents for 4-5 days, whereas in choice tests drip pipes were exposed along with laboratory food. Choice tests were run for 40 days. For each rodent species and anti rodent master batch concentration, three replications were maintained. Tap water was provided *ad libitum*. Observations on damage to pipes (tooth marks etc.) were recorded up to 40 days to evaluate the PE tubes against these rodents. Besides weight of pipes initially and 15 and 40<sup>th</sup> day of exposure were also recorded.

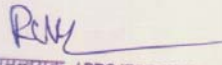
#### RESULTS

**No choice test:** Under no choice tests where rodents remained hungry and were exposed to pipes *Bandicota bengalensis* did not show any preference towards the drip pipes with anti rodent master batch treatments as no tooth ore scratch marks were visible during 4 day long exposure period. However, squirrels, *F. pennanti* and Indian gerbils, *T. indica*, registered some shallow tooth marks on the control (having no anti rodent treatment) as well treated pipes during 5 days exposure period.

**Choice tests:** This test was run for 40 days and the extent of damage by different species is discussed below;

(i) **Lesser Bandicoot Rat, *Bandicota bengalensis*:** The anti rodent master batch treatment proved effective against attack by bandicoots as two of the three replications of 1% treated pipes did not show any tooth marks for the first fifteen days, however one replication registered 25-30 shallow tooth marks all over the pipe. There was no further increase in damage up to 40<sup>th</sup> day. As far as loss in weight of drip pipes due to rodent depredation, the control pipes showed a negligible decrease of 0.2%, but treated pipes showed no decrease in weight. However due to presence of multiple toothy marks in one replication, although of shallower depths, 1% treatment may not be regarded as safe



  
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## EVALUATION REPORT OF LDPE (DRIP PIPES) WITH RODENT REPELLENT MASTER BATCH AGAINST COMMON RODENTS

### INTRODUCTION

Rodents cause serious losses to agriculture, storage, houses, underground pipes and other commodities. All types of damages caused by rodents are not because of their feeding activity only. In fact the rodents have a pair of incisor teeth in each jaw, which is ever growing at the rate of about 0.4 mm/day. To maintain these incisors in proper shape and size, the rodents keep on gnawing and nibbling various commodities including wooden furniture, fixtures, telephone and electrical cables ducts etc. Thus ever-growing incisors make the rodents most destructive.

The drip irrigation is a potential means of irrigation for efficient water use in crop fields and vegetable and plantation orchards. In comparison to conventional flood type irrigation practices, drip irrigation results in saving precious water and yields considerable increase in crop productivity. It is very useful, especially in the areas where the land is undulating and water availability is meager. The drip tubes are always exposed to field rodents and are therefore vulnerable to rodent attack. It is, therefore, necessary to develop rodent proof drip pipes. With this background drip PE tube samples (as detailed below) supplied by M/S Life Line Technologies, Wagle Estate Thane (MS) were evaluated against different rodent species in laboratory.

### METHODS

**The Test samples:** Drip pipes with anti rodent master batch additives (1 and 2% conc.) *vis a vis* drip pipes without anti-rodent additive were tested.

**Test rodent species:** As requested by M/s Life Line Technologies, the drip pipes were evaluated under laboratory against three most abundant rodent species viz., The Indian gerbil, *Tatera indica*; The lesser bandicoot rat, *Bandicota bengalensis* and The five striped squirrel, *Funambulus pennanti*.

All the three rodent species are widely distributed in India. The lesser bandicoot rat, *B. bengalensis* is one the most important rodent pest in Indian Agriculture, occurring in and around human settlements and also in fields and is cosmopolitan in distribution. *T. indica* is essentially a field rodent species distributed in various parts of the country (except the hills). The squirrel, *F. pennanti*, resides in nurseries and horticultural and plantation orchards.

  
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against lesser bandicoots. Increasing the concentration of anti rodent treatment to 2% no sign of attack was observed in any of the treated replications. Therefore this treatment (2% anti rodent master batch) may be regarded as safe for lesser bandicoot attack.

(ii) **Indian gerbil, *Tatera indica*:** This species appeared more damaging to the drip pipe as the signs of rodent attack in anti rodent treated as well as control pipes were almost similar. In case of 1% treatments, gerbils made multiple tooth marks, which deepened with time resulting into 4-6 deep holes. In one case the corners showed deeper cuts. On 15<sup>th</sup> day extent of



damage led to a mean loss in weight of treated and untreated ducts to the tune of 5.25 and 2.0 per cent respectively which increased to 7.25 and 5.5 percent by 40<sup>th</sup> day of exposure. The increase in concentration of anti rodent treatment to 2%, the drip pipes showed relatively higher efficacy against *T. indica*. There was no sign of rodent attack in one replication at all and the other two had very shallow tooth marks. On the other hand the control sample showed multiple tooth marks. As far as decrease in weight of ducts was concerned there was no loss up to 15<sup>th</sup> day and even on 40<sup>th</sup> day it was insignificant 0.2-0.3%. Comparison of the extent of damage/ tooth marks in 1 and 2% treated pipes, the higher concentration may be regarded as relatively effective, however further increase in concentration (> 2%) may be recommended to make the drip pipes safer from Indian gerbils.


(iii) **Five Striped Squirrel, *Funambulus pennanti*:** The squirrels' response towards<sup>LD</sup> PE tubes was most damaging in comparison to the other two rodent species. Both the concentrations of the anti rodent treatments proved completely ineffective against the squirrels. The signs of squirrel attack were visible within 3-4 days of exposure. By 15<sup>th</sup> day the treated pipes (1%) were so much damaged that it recorded a mean loss in weight to the tune of 0.42% which was around 3% in untreated control pipes. Besides multiple bite marks leading to many holes the pipe was cut in 2-3 pieces and by 40<sup>th</sup> day the almost 30% loss in weight was seen treated and untreated pipes. Almost similar observations were recorded with 2% treated pipes also. At this concentration



  
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one of the treated replication suffered multiple cuts and other two had many deeper tooth marks. There was no difference in extent of damage in treated and untreated control pipes by 40<sup>th</sup> day of exposure. The control and treated pipes recorded 15 and 25% reduction in weight due to squirrel attack. Thus the anti rodent treatments (up to 2%) in drip pipes have no anti rodent effect at all against squirrels.

**NOTE: (i) This report is responsible only for the test samples.  
(ii) The report can not be used as foundation for any advertisement.**

  
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