

## A method to deter Syrian woodpeckers from drilling holes in plastic irrigation pipes

ANAT BARNEA AND YORAM YOM-TOV

*Department of Zoology, Tel Aviv University, Tel Aviv, Israel*

**ABSTRACT.** Syrian woodpeckers (*Dendrocopos syriacus*) damage plastic irrigation pipes in orchards and telephone cables by drilling holes in them. The aim of this study was to find a method to prevent such damage. The work was carried out in four localities along the coastal plain of Israel. A continuous follow-up showed that damage was minimal during winter and rose sharply towards summer. A collapsible irrigation pipe which inflates only when water flows into it was found to be inappropriate because holes were drilled in it. Yellow-painted pipes were found to have a deterrent effect on woodpeckers in that no holes were found, whereas the damage in the control pipes was maintained and followed the regular annual pattern.

### Introduction

The Syrian woodpecker (*Dendrocopos syriacus*) is a small bird (about 80 g), common in woodlands in South-Eastern Europe and the Middle East (Grzimek, 1973). It reaches its southern limit of distribution in Israel where, during the past, it occurred in woodlands, but in the last 40 years it has extended its habitat to orchards and other plantations. This bird was considered to be beneficial to humans because its diet contained Buprestidae larvae which are serious pests to trees and timber in general. However, since 1969 it is known to cause damage to plastic irrigation pipes (mainly 16-20 mm diameter) by drilling holes in them (Moran, 1977). In various nut plantations (nuts are the favoured food of woodpeckers) the damage is distributed over the whole plantation, while in other orchards, such as avocado, almond, apple, apricot, persimmon and loquat and other subtropical fruits, it occurs mainly near the margins of the orchard, where there are bigger trees which serve as wind-breaks and which are used by woodpeckers for nesting and food searching. The birds apparently arrive from nearby territories and do not penetrate deeply into the orchard (Moran, 1977). The damage has four facets: (1) the cost of labour for finding the holes and repair to the pipes; (2) the cost of stoppers for drilled holes or pipes which have to be replaced; (3) loss of water through these holes and damage due to reduction in water pressure in the pipes, which causes uneven irrigation; (4) crop losses due to inadequate irrigation. Woodpeckers also drill holes in telephone cables, causing disconnections and enabling water to penetrate into the cables.

The Department of Plant Protection in the Israel Ministry of Agriculture recommends the following measures to reduce the damage (Moran, 1978):

1. Covering irrigation pipes with polyethylene sheets or earth, or by letting annual vegetation grow and cover the pipes;
2. Catching woodpeckers in traps;
3. Offering the birds poisoned bait (nuts injected with poison).

All the above methods proved to be unsuccessful because of technical problems such as blocking of irrigation pipes with soil particles and roots, the need for long pre-baiting periods for traps, and the replacement of dead woodpeckers with others through immigration. Spreading repellent on the pipes or painting them white also proved to be unsuccessful in preventing the damage.

The aim of this work was to find alternative and more reliable method or methods to diminish or prevent woodpecker damage. Ideally, such methods should not affect non-target species and would not need continuous maintenance by the farmers.

### Materials and methods

The work was carried out in four localities in the Coastal Plain of Israel, 10–40 km south of Tel Aviv, in various orchards, where woodpecker damage was reported to be high. At first we were interested to see whether there is a seasonal pattern in the appearance of the damage. For this purpose we visited a 0.3 ha apricot orchard twice monthly from 14 November 1979 until 20 July 1980 and counted all the holes drilled along the 440 m plastic irrigation pipes. The holes were located by sending water along the pipes. Each hole was marked on a map and blocked with a stopper to prevent further leakage.

In the second experiment we wanted to examine the vulnerability of a thin irrigation pipe which inflates only when water flows into it, whereas when empty it lies flat on the ground. We considered that a flat, collapsible non-rigid pipe which contains water only during irrigation periods might not attract (or would be less attractive to) woodpeckers. These pipes are relatively cheap (about two-thirds the price of normal pipes of the same diameter) and have been used to irrigate vegetable fields during the last 3 years. On 22 April 1980 we replaced 116 m of the pipes in an apricot orchard with these pipes, and examined them twice monthly for holes, until 10 August 1980.

In a third experiment, we examined the vulnerability of yellow-painted pipes to woodpecker damage. We chose this colour because it is known in many instances to be a warning colour and to have a deterrent effect on animals, and is used as such by various poisonous insects and their mimics. This experiment was carried out in a 1.2 ha mixed orchard of pecan nuts, peaches and guavas. On 15 July 1980 we marked and blocked all the existing holes in the pipes and two weeks later painted 144 m of the pipes with yellow (wavelength 5800 Å) plastic paint. An additional section of 330 m was painted on 1 April 1981. As controls we had about 1000 m of unpainted pipes and also a section of 66 m painted with black plastic paint manufactured by the same producers (Tambour, Israel). As the paint did not adhere to the pipes, we took care to repaint the pipes in those places where it had peeled. This experiment lasted until 7 June 1981, when the periodical examination ceased.

In the fourth experiment, in a 15 ha orange grove in Gedera, we replaced the entire irrigation system with 1.2 km of 16 mm yellow plastic pipes given to us by

Pelasim Factory, Kibbutz Merchavia, Israel. This experiment began in April 1982 and regular checks are being carried out at present (May 1983).

## Results

The results of the first experiment (Figure 1) showed a marked seasonality in the rate of damage. The damage was minimal during winter and rose sharply towards summer, when it was about ten times heavier. This seasonality may be attributable to the growth of annual plants which cover the pipes, or may indicate that woodpeckers drill holes in order to drink water which is not freely available in the dry

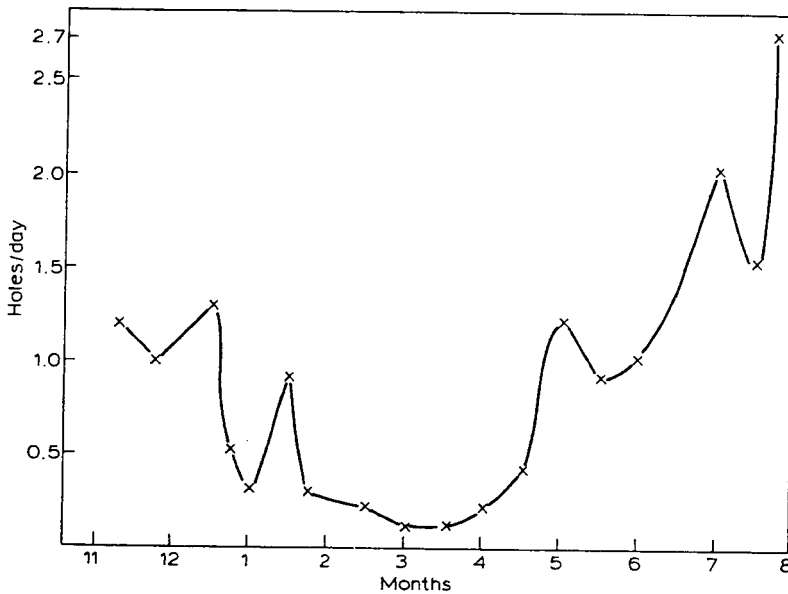


FIGURE 1. Rate of appearance of holes drilled by woodpeckers in 16 mm plastic irrigation pipes in Bet Degan in 1979-80.

Israeli summer. However, this second theory is debatable because damage also occurred in orchards where water was freely available in several places due to leakage, etc. Furthermore, it does not seem likely that the birds are attracted to the sound of water flowing through the pipes, because most holes were drilled when no water was flowing.

The results of the second experiment were negative, i.e. holes were drilled in the collapsible pipes. Many of these holes were double, indicating that they were drilled when the pipe was deflated.

The results of the third experiment are given in Figure 2: three holes were found in the first 3 weeks after the start of the experiment (17 August), a second hole a week later and a fourth hole after 3 weeks (31 August). Subsequently, no other holes were found (apart from one found in January 1981 where the paint had peeled) in the yellow-painted pipes, whereas the damage in the unpainted and black-painted section maintained the same annual pattern as in the first experiment.

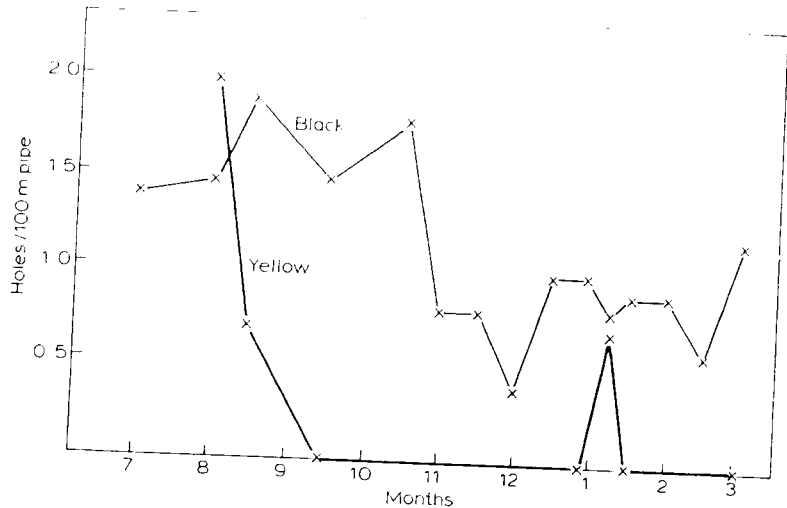


FIGURE 2. Rate of appearance of holes drilled by woodpeckers in 16 mm plastic irrigation pipes in Kidron in 1980-81. Thin line: unpainted black pipes. Heavy lines: yellow-painted pipes.

The results of the fourth experiment were also favourable, and no damage has been reported in the entire orchard during the first year of observation.

### Discussion

The fact that for the long period that the (third and fourth) experiments lasted, few, if any, holes appeared in the yellow pipes, makes us believe that yellow paint or yellow piping deters Syrian woodpeckers from drilling holes in plastic irrigation pipes. The few holes which appeared at the beginning of experiment 3 may have been drilled there before the experiment began. This deterrent effect exists not only in orchards where black pipes were available for drilling (experiment 3) but also in orchards where all the pipes were replaced. We do not know what caused this effect and if it will be long-lasting. We are continuing to pursue the fourth experiment and, with the help of the pipe manufacturer, will extend it to another orchard in the north of Israel.

Woodpecker damage is not limited to plastic irrigation pipes and occurs also in telephone cables where the annual damage is estimated by the Chief Engineer, Ministry of Communications, Israel, to be more than 1 million US dollars. In order to check whether woodpeckers will damage yellow-painted cables, the Ministry of Communications in Israel have replaced (in May 1983) three sections of 1 km each in three localities where woodpeckers systematically drill holes. Ramot, Tel Aviv University for Research and Development, have now applied for an Israeli and foreign patent for the application of the yellow paint to deter woodpeckers.

### Acknowledgements

We are grateful to the many farmers and workers of the Volcani Research Station, Bet Degan, for their help in conducting the experiments and to Pelasim Factory,

Merhavia, for donating the yellow irrigation pipes. Thanks are also due to Dr Chris Feare, who commented on an early draft of the manuscript.

### References

- GRZIMEK, B. (1973). In *Animal Life Encyclopedia*, Vol. 9, pp. 62-69. New York: Van Nostrand Reinhold Co.
- MORAN, S. (1977). Distribution and characteristics of the damage of the Syrian Woodpecker, *Dendroscopus syriacus* (Aves: Picidae) to polyethylene irrigation pipes in fruit orchards. *Phytoparasitica* 5, 127-139.
- MORAN, S. (1978). The damage of woodpeckers to irrigation pipes and to orchards. *Ha'Sadeh* 59, 585-589 (in Hebrew).

Accepted 24 August 1983