

# 竹林金针虫监测及防治技术研究

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**摘要:** 金针虫是鞘翅目 (Coleoptera) 叩甲科 (Elateridae) 昆虫幼虫的通称, 广布于世界各地, 是重要的地下害虫。近年来, 随着我国南方地区笋用竹林大面积种植及苍糠覆盖技术的应用, 金针虫在笋用林内爆发成灾, 造成重大的经济损失。筛胸梳爪叩甲 *Melanotus cribricollis* (Faldermann) 是竹林金针虫的优势种, 在浙江省 3~4 a 发生 1 代, 以幼虫钻蛀竹笋取食, 危害竹芽、竹鞭及竹根等组织器官, 造成大量的虫笋和退笋, 严重影响竹笋产量和商品价值, 造成 60~90% 的种笋死亡, 竹林地衰败加剧, 损失巨大。金针虫隐蔽性强, 危害周期长, 其监测及防治技术一直是植物保护工作的重点和难点。国内外学者对金针虫的监测及防治技术开展了大量研究, 但因竹林生态系统 (种植模式及根系系统等) 的特殊性, 农业金针虫的监测及防治技术大多不适用于竹林金针虫的防治, 对竹林金针虫的监测及防治尚无有效的技术手段。本文对筛胸梳爪叩甲幼虫的食物诱饵进行了筛选, 并对林间金针虫的活动节律进行了监测。另外, 研究了林间挖笋除虫、黑光灯诱杀及药剂防治 3 种方法对筛胸梳爪叩甲的控制效果。结果表明, 在众多食物诱饵中, 玉米+小麦 (1:1) 对筛胸梳爪叩甲的引诱作用最佳, 平均单杯诱捕量达到 2.73 头 (5 月份)。筛胸梳爪叩甲幼虫在林间呈现“M”型的活动节律, 5 月底和 10 月中旬为 2 个活动高峰, 没有越夏习性。林间挖笋除虫、黑光灯诱杀及药剂防治 3 种技术措施均能显著降低该虫的危害率和虫口密度, 其中药剂防治的效果最明显。3 a 持续挖笋除虫的防治效果达 22.76±3.90%; 每年单盏黑光灯年平均诱捕量可达到 1143.8±318.7 头, 连续 6 a 的灯光诱杀可将竹笋危害率由防治前的 56.05±2.83% 降至防治后的 39.207±2.83%; 连续施用 5% 辛硫磷+3% 毒死蜱颗粒剂 3 a 年可将竹笋危害率由防治前的 69.62±5.36% 降至 21.17±7.65%, 防治效果达 70.11±10.99%。本文的研究对于竹林金针虫的监测及防治有着重要的参考价值。

**关键词:** 筛胸梳爪叩甲; 金针虫; 竹笋; 食物诱饵; 监测技术; 防治技术

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# Control Techniques of *Melanotus cribricollis* (Coleoptera: Elateridae)

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**Abstract:** Wireworm, a common name for soil-dwelling larvae of click beetles (Coleoptera: Elateridae) is a serious pest to many economic crops worldwide. In recent years, *Melanotus cribricollis*, occurred extensively and has caused economically severe losses of bamboo production in Zhejiang, China. Larvae of this species injure underground buds and root systems of bamboos, resulting in germination failure, dead-hearts, ratooning failure and losses in stand. Wireworms, due to their subterranean feeding habits, are very difficult to monitor and control. And the monitoring and control techniques for agricultural species of wireworms are not suitable for *M. cribricollis* in bamboo forest. Aimed at finding out the most effective sampling and control methods, the food baits were compared and the feeding behavior of wireworms of *M. cribricollis* were investigated. As well, the effect of three control methods, shoot-removing, light trapping and insecticidal control against *M. cribricollis* in fields were studied respectively in present paper. The results showed that wireworms of *M. cribricollis* were more efficiently attracted by germinating corn seeds mixed with wheat seeds (1:1) than other bait materials, such as sweet potato, corn seeds only and carrot. The peak of feeding of wireworms in bamboo forest occurred in late-May and Mid-October, and the wireworms could be trapped in summer. All the three methods, shoot-removing, light trapping and insecticidal control could reduce the damage and density of wireworms significantly, and insecticidal control was more effective. The control efficiency of shoot-removing against bamboo wireworms was  $22.76\pm 3.90\%$  in three years;  $1143.8\pm 318.7$  adults of *M. cribricollis* could be caught per light per year, and the damage percent of shoots dropped from  $56.05\pm 2.83\%$  to  $39.207\pm 2.83\%$  with light trapping in 6 years. The insecticide blend of 5% phoxim and 3% chlorpyrifos showed effective against *M. cribricollis*, and the damage percent of shoots dropped from  $69.62\pm 5.36\%$  to  $21.17\pm 7.65\%$  in 3 years. The results will assist with better

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wireworm control and management decision making in bamboo forest.

**Key words:** *Melanotus cribricollis*; wireworms; bamboo shoots; bait trap; monitoring techniques; control techniques

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