

The effect of different measures on the control of water and fertilizer loss in pine wilt disease wood cutting land

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Abstract: 【Objective】 From the perspective of water and fertilizer conservation in the damaged land of *Bursaphelenchus xylophilus*, we tried to explore the effective technical measures for rapid surface coverage and effective control of slope erosion in forest areas damaged by *Bursaphelenchus xylophilus*. 【Methods】 This study used the method of simple runoff plots location observation to compare the runoff, sediment and nutrient losses in pine wilt disaster area under different soil management measures such as weed-proof film, biodegradable film and PAM. 【Results】 Biodegradable film-95% treatment resulted in a large amount of runoff due to large area coverage, but its sediment loss control effect was the best, and the nutrient loss in runoff and sediment was much lower than other treatments because of "fertilizer-water isolation". On the other hand, the loss of sediment and nutrients in biodegradable film-67% treatment was significantly higher than that in other treatments because of the alternation of catchment and surface exposure. The control effect of runoff, sediment and nutrient loss of weed-proof film and PAM treatment were better than other treatments at three and six months, and the losses of them were both significantly lower than that of the CK treatment. The effect of PAM treatment was best, among which, the runoff and sediment loss of PAM-95% treatment decreased by 52.1%, 75.6% and 71.7%, 73.0% respectively compared with the CK treatment at three months and six months. However, the control effect of PAM treatment on different nutrients was different, and its effect on N and K loss was better, but the effect on P nutrient loss in sediment loss was not good. In addition, with the extension of time, the control effect of PAM on runoff, sediment and nutrient loss decreased significantly after nine months, while the control effect of water and soil loss and the loss of total and available nutrients in the weed-proof film treatment was still better than other treatments, and the control effect showed as 95% > 67%. Compared with the nutrient content of afforestation land of Chinese fir, it could be seen that the contents of total N, total P and total K of biodegradable film, weed-proof film and PAM were higher than those of CK treatment. Among them, the soil total P and available P of biodegradable film-67% treatment in different soil layers were significantly higher than those of other treatments, while PAM and weed-proof film treatments had a better effect on maintaining the total and available nutrients of N and K. The growth of newly afforested trees also showed that different measures promoted the height growth of Chinese fir, among which the effect of weed-proof film and PAM treatment was better. 【Conclusion】 In the damaged land of *Bursaphelenchus xylophilus*, PAM-95% treatment can be used to quickly and effectively control the soil and water loss of the exposed surface. And the combination of PAM-95% treatment and weed-proof film-67% treatment could be used for the afforestation land with higher conditions, which can achieve the best effect while saving costs.

Key words: *Bursaphelenchus xylophilus*; disaster damaged land; soil management measures; PAM; weed-proof film; biodegradable film; soil and water loss