

Monitoring the incidence of dry rot caused by *Fusarium proliferatum* in garlic at harvest and during storage

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Abstract

Dry rot is an emerging postharvest disease of garlic (*Allium sativum*) attributed to *Fusarium proliferatum*, which has caused huge economic losses in the past few years. In this study, we aimed to detect the presence of *F. proliferatum* on garlic bulbs postharvest during prolonged storage, and to identify other fungal species associated with garlic dry rot. We also quantified the level of fumonisins in symptomatic and asymptomatic cloves. A total of 100 plants were sampled from three production seasons at six farms located in Northern Italy at three time points (at harvest, processing, and 6 months post-storage at $-4\text{ }^{\circ}\text{C}$). The *Fusarium*–garlic pathosystem was split into two parts: basal plate/root and bulb. *F. proliferatum* was the dominant fungus in infected bulbs and was confirmed as the causal agent of dry rot in garlic postharvest (mean incidence: 35.4 %). *F. oxysporum* co-occurred with *F. proliferatum* but caused disease only in the basal plate/root. Dry rot incidence slightly increased during cold storage (from 14.6 % at processing to 18.4 % at 6-month storage). Although *F. proliferatum* incidence was stable during cold storage, fumonisins were produced. Symptomatic cloves were more contaminated than asymptomatic cloves, both by the fungus (mean incidence 39 % vs. 25.3 %) and the toxin (287.0 vs. 24.4 $\mu\text{g kg}^{-1}$). These results suggest that cold storage delays the progression of dry rot, but the risk of health issues related to fumonisins and the occurrence of infection in asymptomatic cloves should be seriously considered.