Study on the Current Dituation of Caragana Seed Pests and Their Methods of Invasion in Inner Mongolia

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Cultivated caragana fabr . are generally called caragana . Their great adaptability and rapid self-reproduction make them effective in controlling soil erosion . Moreover , they are useful as industrial raw materials , feed , wood , fuel , oil and fertilizer . Presently there are 66 species of caragana fabr . in China , and 16of them are located in Inner Mongolia where the main cultivated species ´are caragana korshinskii kom、caragana intermedia and caragana microphylla Lam . Since the area of cultivation of caragana has been increasing recently , the price of caragana seed has also risen . However , problems such as low germination and low 1000-grain weight , which are mostly caused by seed pests , impede the development of the caragana seed industry . Study on caragana seed shows that the average loss of weight in every thousands seeds is 3 .12g , and the average decrease in germination rate reaches 9 .51% because of seed pests in Inner Mongolia . The percentage of damaged seeds is about 40% in Hanjinqi , Inner Mongolia . Therefore caragana seed pests are the main factors hindering the development of the caragana seed industry .

An investigation in July 2003 showed that caragana seed pests of bruchophagus neocaraganae , kytorhinus immixtus and etiella zinchenella spread widely in Inner Mongolia . According to the classification criterion for the degree of pest invasion , the invading degree in every sample point was higher than ++ , with 40% sample points having invasion values higher than ++ and 60% sample points with invading degrees higher than +++ . Evidently , the damage caused by seed pests was immense .

On the other hand , percentage of damaged seeds varied in the different areas . The seed pests badly invaded caragana seeds in Ordos , where the damage was 39 .55% ; it was slightly lower in Xilinguole where the percentage of damaged seeds was 31 . 95% . Correspondingly , the percentage of damaged seeds were 20 .32% , 23 .70% , and 14 .82% in Chifeng , Hohhot and Tongliao , respectively .

The three seed pests' methods of invasion are as following : kytorhinus immixtus adults oviposit on the peels , and after hatching , the larvae bore into fruit under the eggshell , then bore in seed by holing the hilum ; etiella zinchenella adults oviposit under the calyx , and after hatching , the larvae bore into dorsal suture under eggshell ; bruchophagus neocaraganae adults oviposit in seed .

The study also evaluated chemical and biological control methods for caragana seed pests . The field experiments revealed that preventative chemical control methods achieved and efficiency reaching over 80% . However , using natural enemies are the more important measures to control pests . Since March in 2004 , we conducted a study on parasite of bruchophagus neocaraganae and kytorhinus immixtus by investigating seeds that had been collected the previous year . The result showed that natural enemies of these pests were apanteles sp . ,bracon nigrovufum (Cushman) and eulophidae .

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