

Title Do resistant seeds offer a worthwhile avenue for progress in stored product protection?
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Citation Advances in stored product protection. Proceedings of the 8th International Working Conference on Stored Product Protection, York, UK, 22-26 July 2002 (2003); 50-58

Abstract

Most plants support the development of many specialist and a few generalist insect species. The corollary is that herbivorous insects tend to be associated with a very limited number of host species. Frequently this restriction on an insect's capacity to utilize a particular plant has been ascribed to the presence of plant-produced allelochemicals and has been exploited in several direct and indirect ways for the protection of stored commodities. For example, extracts made from many plant parts and powders prepared from dried ground plants have frequently been considered as possible additives to protect stored grain and legume seeds. Some experiments have gone further and have attempted to identify the active chemical agents in such oils and powders, suggesting their usage in a purified form. However the practical application of these findings is rarely reported. Alternatively, but with actually a similar philosophical basis, is the suggestion that one can identify "resistant" populations or cultivars of a crop and interbreed them with other cultivars possessing more desirable agronomic characteristics, transferring the resistant property and thereby yielding cultivars which are pest resistant. Resistance is frequently, though not always, associated with changes in plant chemistry. Modern molecular genetics enhance the speed of plant breeding and also allow the introduction of genes from other species. Is any of this work worthwhile? Are we taking traditional wisdom about food protection, allying it with modern plant breeding programmes and yet forgetting the pest biology? In this paper we propose to take examples from research on bruchids living on cowpeas and suggest that the results of plant breeding will rarely provide a long-term solution to the protection of stored seeds. Charles Darwin noted the occurrence of individual variation among organisms and the power of selection; all control measures for pest insects, including the use of botanicals and resistant seeds, are effectively selecting agents we would do well to remember the consequence, evolution, when considering how to protect stored seeds.