

Physical Barriers Against Insect Potato Pests: Locking The Door To Insects

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In pest management, control methods can be divided into two groups: preventative and curative. This presentation focuses on the first group and looks at how physical control methods can be used to prevent the insect pests from gaining access to the potato crop. Agricultural crops are open to insect invasions. Physical barriers act as a first line of defense to lock the door to invaders or to decrease the number of individuals reaching the crop. In conventional potato production, curative (e.g. insecticides) control methods are often preferred over preventative methods because of their availability and ease of use. In organic potato production, it is more imperative to consider preventative methods because of the limited range of curative methods available.

Recent research on the ecology of field invasion by adult Colorado potato beetles, the most important defoliator of the crop, is reviewed to show how invasions can be significantly reduced with plastic lined trenches and floating row covers. A determinant factor of the efficacy of perimeter treatments such as barriers is their installation or application as early as possible in the season. Although it is difficult to lock aphids out of potato fields other than by the use of floating row covers, their role as vectors of virus disease in seed potato production can be decreased using mineral oil sprays and border crops. The first acts as a barrier to virus acquisition or transmission and the second as a trap to infected landing vectors. Separating the new potato crop from previous plantings by distance or by landscape features constitute the most efficient barrier to invasion for many of the primary and secondary pests of the potato crop.

Organic potato producers are well aware that although insect pests can be managed without chemical insecticides, they can be challenging. A key challenge is cost. A study carried out in New Brunswick, estimated the cost of using physical barriers in combination with biological agents to control Colorado potato beetles at 1.6 – 7.5 times that of using chemical insecticides alone. However, because physical barriers and other perimeter based control methods are less costly to use in large than in small size fields, these control methods are likely to become more cost competitive and to play an important role in the future as organic potato production acreage expands.

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