

## Without Fungicides, Northeastern Cranberries Would Succumb to Rots

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The American cranberry industry began in Massachusetts with the hand harvest of native populations of plants. Today, growers in Massachusetts and New Jersey produce 200 million pounds of cranberries which represents 33% of U.S. production.

Cranberry growers must control at least eight and as many as fifteen fungal pathogens that can cause significant crop loss. In Massachusetts and New Jersey, early rot infects all cranberry beds and can cause 100% losses if not controlled [1]. The fungi that cause fruit rots in cranberries overwinter on infected living and dead vine leaves and stems and on rotted fruit left in the field [2]. Wind and wind-driven rain disperse fungal spores from their overwintering hosts. These spores land on blossoms or small, developing fruit and will penetrate the plant tissue if there is a suitable layer of moisture present for 6-8 hours. Early rot first appears as a small light-colored watery spot, which enlarges rapidly until the whole berry becomes soft. Cranberries with end rot are often distended by gas produced by the rotting process and may burst from the increased pressure [2].

Soon after the establishment of the first cranberry beds in New Jersey, a severe fruit disease eliminated most of the crop [3]. Prior to the use of fungicides, cranberry fruit rot was responsible for up to 100% crop loss in worst-case scenarios and routinely reduced the New Jersey crop by 33% [3]. With the development of Bordeaux mixture (copper plus lime sulfur) in the late 1800s, cranberry fruit rot could be reduced by as much as 10 to 50% [4]. The spraying of cranberry beds for disease control has been a general practice of New Jersey and Massachusetts cranberry growers since about 1900 [4]. Cranberry growers stopped using Bordeaux in response to the greater effectiveness of synthetic chemical fungicides and research that showed vine thinning and damage resulted from repeated annual sprays of Bordeaux [5]. Currently, cranberry fruit rot losses range from less than 1% to 15% annually [3]. However, the loss of registered fungicides for cranberry disease control could lead to nearly complete crop loss within 5 years [3].



Rotted cranberries



Harvesting cranberries



Left: Fungicide protected  
Right: Rotted

### References

1. Hickey, K.D. 1991. *Fungicide Benefits Assessment Fruit and Nut Crops – East*. USDA National Agricultural Pesticide Impact Assessment Program.
2. Caruso, F.L. and D.C. Ramsdell, Eds. 1995. *Compendium of Blueberry and Cranberry Diseases*. APS Press.
3. Oudemans, P.V. et al.. 1998. Cranberry fruit rot in the Northeast : a complex disease. *Plant Disease*. 82(11):1176-1184.
4. Bergman, H.F. 1953. Disorders of cranberries. *Yearbook of Agriculture*. USDA.
5. Peterson, B.S. et al. 1968. *The Cranberry Industry in Massachusetts*. Department of Agriculture, Division of Markets, The Commonwealth of Massachusetts. Bulletin No. 201.