

Public Abstract

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Title:Husk Softening and Kernel Characteristics of Eastern Black Walnut (*Juglans nigra* L.) Cultivars at Successive Harvest Dates

In the United States, an average of 11,340 MT of hulled Eastern black walnuts (*Juglans nigra* L.) are sold to buying stations annually. The majority of the black walnuts are harvested from wild trees after they have fallen to the ground. Subsequently, yield loss occurs from competition with wildlife and kernel quality is poor. Nuts harvested from the ground have dark-colored husks and kernels inside the shell are also dark-colored. A stain from the husk can penetrate the shell and result in discolored kernels and strong flavors. Although there are no color standards currently for black walnuts, light-colored kernels are desirable. A study was conducted to 1) identify a method to determine the optimal harvest date; 2) develop a quantifiable color classification for kernels; and 3) quantify the effect of delayed husk removal on kernel color. Walnuts were collected weekly. Husk denting, hardness, and color measurements were recorded immediately after harvest. Nuts were then hulled and the in-shell fresh weights were recorded. After drying for five weeks, kernel color and percent kernel were assessed.

Husk softening, measured by a durometer, provided a reliable and quantitative method for determining date of harvest to maximize percent kernel. Percent kernel generally increased over time. As husk softening occurred, kernels became darker in color. LCH sum was found to be the most reliable value for color sorting kernels. This study demonstrated that three color categories can be established. When husk removal was delayed two weeks, kernels were generally darker in color.