

Pericarp Damage in Seed Corn

INTRODUCTION

The pericarp of a corn kernel is maternal tissue surrounding the embryo sac and nutritive tissues. It has a vascular connection into the corn cob so nutrients from photosynthesis can be supplied to the developing embryo and endosperm. Once seeds reach physiological maturity an abscission layer is formed, this is known as the “black layer”, which blocks the vascular tissue. As the seed dries, the pericarp adheres tightly around the endosperm and embryo. Some hybrids lose the pedicel tip upon shelling which may expose the black layer (Figure 2B.). Shelling corn with high moisture may cause tears in the pedicel area of the pericarp. Other areas of the pericarp can be damaged due to impacts and abrasions during handling and seed conditioning. Rounds can be susceptible to damage due to the plumule being more exposed or even a raised surface. (Figure 2). Because the plumule is less protected severe damage can occur due to impacts and often correlates to a seedling with a damaged coleoptile, growing points and/or shredding of the embryonic leaves. The seed corn industry is expanding the use of plant dessication to reduce the occurrence of raised plumules.

DEFINITIONS

Black layer: abscission layer between embryo and pedicel tip.

Coleoptile: protective covering over plumule leaves that aids in shoot emergence through soil.

Embryonic axis: small plant (root, meristem, scutellum and shoot tissue).

Raised embryo: certain hybrids or seed sizes may have an embryonic axis that is raised and exposes the axis to mechanical impacts.

TESTING

To help identify pericarp damage, dry seeds are submerged in a contrasting dye which penetrates any cracks in the pericarp, after one-minute seeds are removed, rinsed, dried and evaluated. Categories range from no damage to severe based on where the pericarp tearing, or cracking occurs.

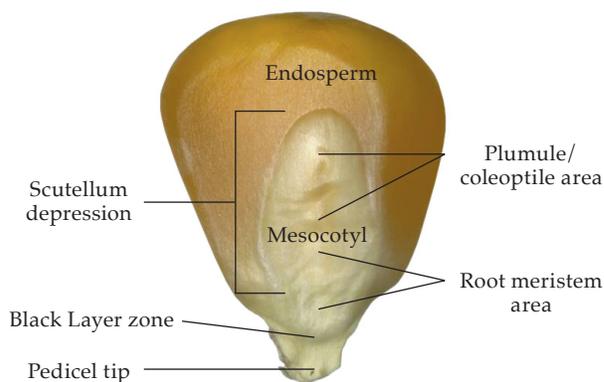


FIGURE 1. Photo of a corn kernels with structure identified.

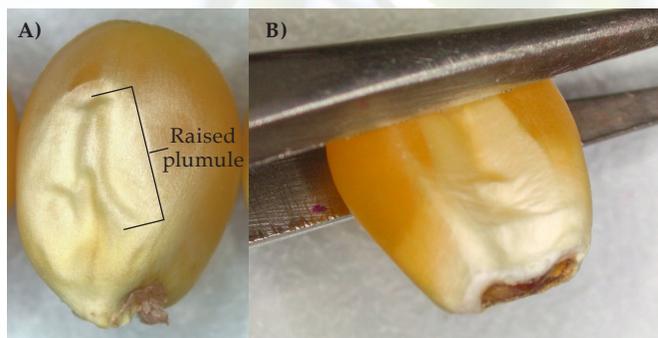


FIGURE 2. A) Raised plumule, B) Black layer exposed

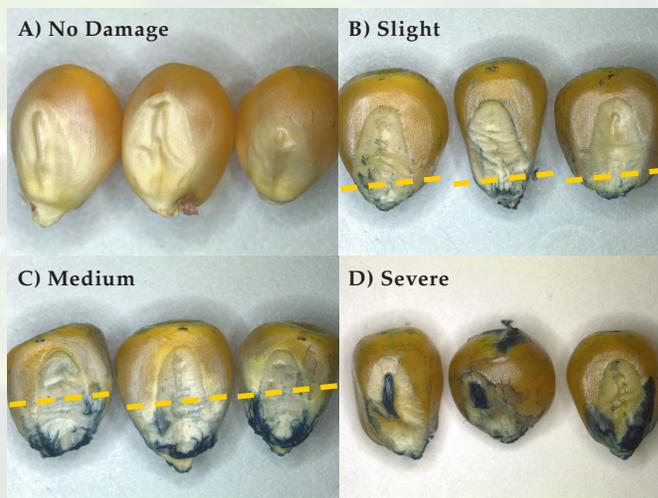


FIGURE 3. A) None: no visible damage to pericarp covering, B) Slight: tearing of pericarp area extending up less than 25% length of embryo pericarp margin/edge, C) Medium: tearing of pericarp extending up to 50% of length of embryo pericarp margin/edge and D) Severe: cracks over the embryonic axis and major breaks in seed or missing parts of the seed.