Bouquet Ears in Corn

Bouquet ears in corn is generally an uncommon occurrence. Some territories are finding more bouquet ears than normal. There are several theories about factors that may potentially increase the risk for bouquet ears, but a definite cause is not known.

What is a Bouquet Ear?
Most field corn grown in the Midwest produces one ear per stalk. When there is more than one ear per stalk, different terms are used to describe where and how the multiple ears develop (Figure 1):

**Prolific hybrids** are more apt to produce two ears per stalk. Generally the two ears express themselves at lower populations or on field edges, and develop at different nodes on the stalk.

**Twin ears** are two ears at the same node, that may or may not develop from the same shank. The primary ear is often larger.

**Bouquet ears** have three or more ears are at the same node, and may or may not develop from the same shank. The middle photo in Figure 1 shows multiple shanks at the same node. If kernel set is poor on the primary and tertiary ears, potential yield loss may be substantial. In 2006, fields in Iowa were reported to have yields of 50 bushels per acre with poor kernel set on bouquet ears. More frequently, the ear development is relatively normal for the primary ear and potential yield loss is minimal.

Basics of Ear and Shank Formation
The number of potential ear shoots is determined around V5. Apical dominance, a strong characteristic in corn, is driven by plant hormones and causes the plant to allocate resources to a primary ear. Hence, even though several potential ear shoots may have developed at V5, only one often produces a harvestable ear.

Bouquet ears are often at the node below where the primary ear would be. This indicates that stress at V6 or V7 likely stopped normal development of the primary ear, thereby breaking apical dominance. That disruption of the hormone balance which causes the plant to allocate resources to the secondary ear shoot, may contribute to multiple ears developing at the secondary node.

Shanks are similar to stalks. Husks are attached at a node on the shank, as leaf sheaths are attached at a node on the stalk. Ears may develop at various nodes on the stalk, and in some cases, ears may develop at nodes on the shank. It is difficult to determine why twin and bouquet ears can develop from the same shank, or from separate shanks at the same node, as information on the timing of shank development relative to growth stage is limited.

Factors Contributing to Bouquet Ears
Field histories from fields with prevalent bouquet ears have not revealed any strong common threads. Differences have been seen among hybrids, and different hybrids might have different triggers.

Growth chamber studies indicated the following are some of the factors that may increase the risk of bouquet ears:
- Longer photoperiods - Corn exposed to 16 hours of light versus 12 hours of light in early vegetative stages
- Cool Temperatures - 50º F or lower for 3 to 7 days around V6
- Water - Flooding during cold temperatures

Management Options
Management options are normal practices that help minimize the risk of conditions that can result from the interaction between genetics and environment:
- Planting a package of hybrids with different relative maturities and diverse genetic backgrounds
- Minimizing stress (compaction, nutrient deficiencies, etc) to help the corn crop be better able to cope with adverse conditions.

Sources: