

Hybrid Yearbook – Rating System Explanation

Purpose

The "Hybrid Yearbook" project requires farmers in the project to select and provide the hybrids they want to study. Those hybrids are then dispersed to different farmers in the project to have the plots in multiple locations, when possible.

The purpose of the project is to study hybrid flex. All hybrids flex in ear size, but not all in the same way. The way in which a hybrid flexes helps us to understand when that hybrid is most susceptible to stress, resulting in a yield loss.

Method

We are attempting to induce stress via population to gauge how the plant responds. For most locations, we plant the low at 22,000 to give it a low stress environment but high enough population to avoid double ears, producing the biggest ear possible. We then raise the population to simulate stressing the plant, (same amount of resources have to feed more plants). For most locations, this high population is at 36,000.

We then collect 10 representative ears from each hybrid at each population. We husk and photograph each set of ears, then count rows around and long on each ear, weigh and shell the ears, weigh the grain after shelling, and get a moisture reading on the sample. When possible, there are also plant and tassel pictures taken during the season to look at plant height and leaf structure.

Rating System

We use the data collected from this project to assign the hybrids flex category rating (G-L1-L2-D). Some hybrids flex in mostly one area, while some flex in all four. As we evaluate all the data and pictures, we assign letters for all categories where a significant amount of flex is shown and **bold** the letter in the area where the hybrid flexes the most.

This year we have also added a flex scale to help compare across hybrids. It is a number rating system that helps to compare the flex of one hybrid against others that we have tested. Each flex area (G-L-D), as well as overall flex, will receive a rating between 1-10. The higher the rating, the more flex we have observed. Two hybrids may both be rated as a **G** because that is where each of those hybrids predominantly flexed. The flex scale number would then help compare how strongly each hybrid flexed.

G - Flex in Girth

A flex in girth would be in relation to the number of kernels around, which is set by V6 and would be denoted with a "G". These hybrids have shown to be more susceptible to early season stress and need to be protected during this time.



L1 - Flex in Length (Early)

Flex that happens because of stress occurring at V7-VT would affect total kernels long and would be given an “L1” rating. This is a reduction in overall ear and cob length. It produces a shorter ear and the stress occurs prior to tasseling.



L2 - Flex in Length

Flex that happens because of stress occurring at R1-R3 will have aborted kernels on the ear tip and will have visible cob sticking out, which will be given an “L2” rating. As an example, if a hybrid pollinates to 45 long and aborts back to 30 long, we call that an L2 hybrid, meaning it flexed after tasseling.



D - Flex in Depth

If a hybrid doesn't change in kernel count, but changes a lot in weight, that is a hybrid that flexes in kernel depth, and we call it a D hybrid. Flex in depth will be seen in the weight per kernel, or how much starch is packed into each kernel. This will occur in the last 30 days before black layer. These hybrids are susceptible to yield loss when they have stress in the later part of the season.



Conclusion

Understanding when a hybrid flexes gives us clues as to when stressing that hybrid is most likely to create a yield loss. Knowing this, we can better manage when it is less risky to allow that hybrid to be under stress and when it will come at a higher cost based on the potential risk/reward for that individual hybrid. This knowledge helps growers to realize that ROIs for certain practices could be different for each hybrid depending on when/how they are alleviating stress (starter fertilizer, split applied N, fungicide, etc.). It also gives growers insight into picking hybrids for known field conditions/limitations.

Examples:

- G** : Phosphate is the main driver of early growth. If you are not putting phosphorus on with the planter in low testing phosphorus soils or high pH fields where, due to tie-up, early season phosphorus is unavailable, then you will want to stay away from **G** hybrids. The lack of phosphate available to the plant in early season typically produces slow early growth during a period that **G** hybrids are most susceptible to stress causing a yield reduction.
- L1**: When L1 hybrids are stressed from V6 to tassel, ears get shorter. If planting **L1**s in a corn-on-corn rotation, the carbon penalty must be managed to avoid the corn turning yellow during a period that is likely to create higher yield loss.
- L2**: For L2s, the focus is on keeping the plant healthy and under minimal stress in the R1-R3 window. This may require managing nitrogen with late season Y-drops on years with high nitrogen loss. When **L2**s run out of nitrogen after tassel they will pull back hard.
- D** : D hybrids need good growing conditions in the last 30 days to get the starch into the kernel. Putting a **D** hybrid in light soils that tend to run out of water will be an increased risk of putting that hybrid under stress at a time that makes a big impact on yield.