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Corn Hybrids: Choosing the Right One

► Choosing which corn hybrid to grow is one of the first steps in planning for the next season and an important one to secure yield and profitability. Many factors affect hybrid performance and must be considered in the selection process.

Research indicates that picking the right corn hybrid can impact 20 percent of the final yield, after weather (27 percent) and nitrogen management (26 percent). Hybrid selection must be guided by knowledge of field conditions, pest and disease pressure, regional adaptation, and relative maturity. These factors influence overall production costs and management practices in areas such as fertilizer use, pesticide applications, and irrigation.

Yield Potential

Effective management strategies depend on proper hybrid selection based on yield potential. In some cases, even the best management practices may not result in high yields due to the hybrid chosen. It is important to prioritize use of hybrids that demonstrate consistent and superior yield performance across different locations and growing seasons.

Field Environment

Climate variability within regions may require selecting different hybrids for specific locations. Hybrids may break or lodge if adverse weather events occur during stalk development. Poor stalk strength can reduce yields due to increased harvest losses. Be sure that hybrids match field conditions, such as soil type (sand, loam, clay), drainage (poor or good), fertility (low vs. high organic matter), machinery type (seeding rate, row width, planting depth preferences), planting date, and drought risk. Also evaluate hybrid tolerance to any predominant disease in the field, especially when there is crop residue on the ground, field history of disease, or corn planted after corn.

Traits and Tolerances

Hybrids with genetic traits can provide insect protection (root and shoot worms), herbicide resistance (glyphosate, glufosinate, 2,4-D, dicamba, ALS-inhibitor, HPPD-inhibitor), disease resistance/tolerance

packages, and characteristics related to stalk and root strengths (stay green) and drydown speeds. Some hybrids contain two or more technologies in the genetic traits.

Traits related to insects and herbicides are great tools, but rotating management strategies can help delay resistance development. Grain drydown is the ability of a hybrid to dry down quickly to allow for earlier harvest or to reduce grain drying costs. Standability can influence harvest timing by indicating how long a hybrid can remain in the field before harvest. This feature is particularly important for fields that are typically wet in the fall or are harvested later in the harvest sequence. Also important is hybrid susceptibility or tolerance to diseases. Some hybrids may not be a good choice if susceptible to a certain disease predominant in the area.

Table 1 presents all the traits and technologies to consider when choosing a hybrid.

Maturity

Hybrids are based on relative maturity (RM), which refers to how long a hybrid takes to reach physiological maturity compared to other hybrids. It is a rating system based on number of days that helps farmers match hybrids to their growing conditions. In north Alabama, the range is 110 to 115 days, in central Alabama 112 to 118 days, and in south Alabama 115 to 120 days. Make sure the RM is adapted to your region, and never plant your entire farm with one RM.

A different classification system can be used to compare corn hybrids. The growing-degree units (GDUs), also called growing-degree days (GDDs), represents the amount of heat accumulated, which determines how fast a corn plant develops. It is basically a measure of how warm the day is relative to the temperatures corn needs to grow. Basal temperature is above 50 degrees F, and optimum is below 86 degrees F. This is calculated daily using the average between the maximum (T_{max}) and the minimum (T_{min}) temperatures minus 50.

Seed Cost

Seed cost is a determining factor when selecting a corn hybrid. Advances in technology have increased seed costs but have also provided greater yield stability, improved crop health, and enhanced genetic performance. Balancing seed cost, technological traits, and yield potential represents a critical management decision. Reducing the number of genetic traits may lower seed costs; however, this may result in increased costs with inputs such as additional pesticide applications. A hybrid that yields 5 bushels more but costs $40 more per bag may not be profitable.

Trial Information

Trials are designed to evaluate hybrid performance under varying conditions, including row spacing, fertilizer management, irrigation vs. nonirrigation, regional differences, soil types, and till or no-till systems.

Many sources of hybrid performance information are available, including on-farm trials, seed company catalogs, Extension agents, agronomists, university reports, and regional testing programs, such as the Official Variety Testing (OVT) conducted by Auburn University. AU OVT compares the yield potential of hybrids under management practices commonly used by farmers in Alabama. More detailed information on OVTs and on-farm trial results is available at on the Alabama Agricultural Experiment Station website at aaes.auburn.edu.

References

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Table 1. Traits and Technologies Available for Corn Production Considering Hybrid Selections

Technology/Trait	Description	Refuge Requirements	Insects Controlled	Herbicide Tolerance
SmartStax RIB Complete Corn Blend	Mix of 95% Bt traited and 5% refuge seed interspersed. Proven to have a 10 bu/a advantage over non-Bt traited corn and a 20 bu/A advantage over non-Bt treated corn plus a soil-applied insecticide	5% in the bag	European corn borer, fall armyworm, rootworm	glyphosate, glufosinate
SmartStax Prox RIB Complete Corn Blend	Protects against corn rootworms. Combines benefits of SmartStax technology with additional RNAi-based mode of action, making it the first product with three modes of action for corn rootworm control. Makes refuge compliance for the corn-growing area easier	5% in the bag	European corn borer, southwestern corn borer, fall armyworm, black cutworm, corn earworm, rootworm	glyphosate, glufosinate
Trecepta RIB Complete Corn Blend	Has Cry1A.105, Cry2Ab2, and Vip3Aa20 from Bt. Also contains Roundup Ready 2 technology, providing tolerance to in-crop applications of labeled glyphosate herbicides when applied according to label directions	5% in the bag	European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, stalk borer, sugarcane borer, beet armyworm, true armyworm, black cutworm, western bean cutworm, lesser cornstalk borer, dingy cutworm	Roundup Ready 2 (glyphosate)
DroughtGard Hybrids with VT Double PRO RIB Complete Corn Blend	Contains the first double-stacked trait with dual modes of action for aboveground insects. Superior genetics with new drought-tolerant trait technology to withstand drought conditions for a better chance of maximizing kernels per ear and yield potential	5% in the bag	European corn borer, southwestern corn borer, fall armyworm, corn earworm	glyphosate

Table 1. Traits and Technologies Available for Corn Production Considering Hybrid Selections (cont.)

Technology/Trait	Description	Refuge Requirements	Insects Controlled	Herbicide Tolerance
VTDouble PRO RIB Complete Corn Blend	Mix of 95% traited and 5% refuge seed. Contains dual modes of action for protection against insects	5% in the bag	corn earworm, European and southwestern corn borer, fall armyworm	glyphosate
Agrisure GT	Provides tolerance to in-crop applications of glyphosate-based herbicides. Good option for refuge acres in a structured refuge operation	20% of total corn acres must be planted to a non-Bt hybrid and in cotton-growing area. 20% structured refuge required, often with additional requirements	corn borer, rootworm	glyphosate, glufosinate (Agrisure 3000GT)
Agrisure Above	Provides integrated E-Z Refuge seed blend featuring multiple modes of action against corn borers, as well as suppression of ear-feeding insects. Ideal in areas where corn rootworm management is not a primary concern	20% structured non-Bt refuge in corn-growing area or 5% for E-Z Refuge (in bag). Must be planted within or adjacent to the BT field (up to ½ mile away)	European corn borer, southwestern corn borer, black cutworm, southern cornstalk borer, lesser cornstalk borer, sugarcane borer	glyphosate
Agrisure Viptera 3110	Provides aboveground insect control with multiple modes of action against aboveground insects and the convenience of an integrated E-Z Refuge seed blend. Ideal for areas where corn rootworm management is not a primary concern	20% structured refuge in both corn-growing and cotton-growing area within ½ mile	corn borer, broad Lep. corn earworm, fall armyworm, western bean cutworm, black cutworm, sugarcane borer	glyphosate, glufosinate
Agrisure Viptera 3111	Provides the same attributes as Agrisure Viptera 3110, plus belowground rootworm protection	20% structured refuge required, often with additional requirements	rootworm, corn borer, broad Lep. corn earworm, fall armyworm, western bean cutworm, black cutworm, sugarcane borer	glyphosate, glufosinate

Table 1. Traits and Technologies Available for Corn Production Considering Hybrid Selections (cont.)				
Technology/Trait	**Description**	**Refuge Requirements**	**Insects Controlled**	**Herbicide Tolerance**
Duracade	Provides season-long control of corn rootworm and corn borer, as well as suppression of ear-feeding insects. Includes mode of action that acts against corn rootworm, with an integrated E-Z Refuge seed blend	5% in the bag	corn rootworm, corn borer, black cutworm, armyworm, corn earworm	glyphosate, glufosinate
Duracade Viptera	Provides 16 target insects (above- and belowground), offering the highest level of control for pests, including a unique mode of action that performs against corn rootworm, and the convenience of an integrated E-Z Refuge seed blend	5% in the bag	rootworm, corn earworm, fall armyworm, true armyworm, European corn borer, southwestern corn borer, sugarcane borer, southern cornstalk borer, lesser cornstalk borer, cutworm	glyphosate, glufosinate
Duracade Viptera Z3	Provides above- and belowground insect protection and the convenience of an integrated E-Z Refuge seed blend. Optimized for superior aboveground protection, specifically against western bean cutworm, and improved yield potential under moderate rootworm pressure	5% in the bag	rootworm, corn earworm, fall armyworm, true armyworm, European corn borer, southwestern corn borer, sugarcane borer, southern cornstalk borer, lesser cornstalk borer, cutworm	glyphosate, glufosinate
PowerCore Enlist	Provides aboveground protection and weed management. Features three modes of action against aboveground pests: Cry2Ab2, CryA.105, and Cry IF. Tolerance to herbicides glyphosate, glufosinate, 2,4-D, and FOPS	5% refuge in Corn Belt and 20% separate structured refuge in cotton region	European corn borer, fall armyworm, southwestern corn borer, black cutworm	glyphosate, glufosinate, 2,4-D, FOPS
PowerCore Enlist Refuge Advanced	Provides aboveground protection and weed management. Features three modes of action against aboveground pests: Cry2Ab2, CryA.105, and Cry IF. Tolerance to herbicides glyphosate, glufosinate, 2,4-D, and FOPS	5% in the bag	European corn borer, fall armyworm, southwestern corn borer, black cutworm	glyphosate, glufosinate, 2,4-D, FOPS

Table 1. Traits and Technologies Available for Corn Production Considering Hybrid Selections (cont.)

Technology/Trait	Description	Refuge Requirements	Insects Controlled	Herbicide Tolerance
PowerCore Ultra Enlist	Provides aboveground protection and weed management. Features four modes of action against aboveground pests: Vip3A, Cry2Ab2, CryA.105, and Cry IF. Tolerance to herbicides glyphosate, glufosinate, 2,4-D, and FOPS	5% refuge in Corn Belt and 20% separate structured refuge in cotton region	European corn borer, fall armyworm, southwestern corn borer, black cutworm	glyphosate, glufosinate, 2,4-D, FOPS
PowerCore Ultra Enlist Refuge Advanced	Provides aboveground protection and weed management. Features four modes of action against aboveground pests: Vip3A, Cry2Ab2, CryA.105, and Cry IF. Tolerance to herbicides glyphosate, glufosinate, 2,4-D, and FOPS	5% in the bag	European corn borer, fall armyworm, southwestern corn borer, black cutworm	glyphosate, glufosinate, 2,4-D, FOPS
Vorceed Enlist	Offers above- and belowground insect protection and weed control. Includes three modes of action and RNAi+Cry3Bb1 approach in combination with proven Bt proteins in DP4114 to reduce CRW population. Tolerance to herbicides glyphosate, glufosinate, 2,4-D, and FOPS	20% separate structured refuge in cotton region	western and northern corn rootworm, European corn borer, fall armyworm, southwestern corn borer, black cutworm	glyphosate, glufosinate, 2,4-D, FOPS
Optimum AcreMax	Provides single-bag, multiple modes of action solution for aboveground insect protection. Contains 95% Bt with two modes of action aboveground (HX1, YGCB) blended with 5% in-the-bag non-Bt	Contains integrated refuge. But in cotton-growing areas, 20% separate, non-Bt corn borer refuge required within 1/2 mile	European corn borer, fall armyworm, black cutworm, western bean cutworm, corn rootworm	glyphosate, glufosinate
Optimum AcreMax TRIsect	Offers seed-based, in-the-bag, integrated refuge solution for corn, providing above- and belowground insect protection, allowing for no separate, structured refuge in most areas. Incorporates HX1 and RW technology to protect against European corn borer, rootworm, and different caterpillars	Eliminates need for planting separate 20% refuge in Corn Belt (95% Bt/5% non-Bt)	European corn borer, southwestern corn borer, black cutworm, fall armyworm, corn rootworm larvae	glyphosate, glufosinate

Table 1. Traits and Technologies Available for Corn Production Considering Hybrid Selections (cont.)

Technology/Trait	Description	Refuge Requirements	Insects Controlled	Herbicide Tolerance
Optimum AcreMax Xtra	Provides single-bag, multiple modes of action solution for above- and belowground insect protection. Contains 95% Bt with two modes of action aboveground (HX1, YGCB) blended with 5% in-the-bag non-Bt	Contains integrated refuge. But in cotton-growing areas, 20% separate, non-Bt corn borer refuge required within ½ mile	corn rootworm (western, northern, and Mexican), European corn borer, black cutworm, western bean cutworm, fall armyworm	glyphosate, glufosinate
Optimum AcreMax Xtreme	Provides single-bag, multiple modes of action solution for above- and belowground insect protection. Contains 95% Bt with three modes of action aboveground (HXX, YGCB, RW) blended with 5% in-the-bag non-Bt	Provides single-bag refuge for both above- and belowground pests (5% blend) but still requires 20% separate refuge in cotton-growing counties	European corn borer, fall armyworm, black cutworm, western bean cutworm; high-level protection against corn rootworm	glyphosate, glufosinate
Optimum Leptra	Provides aboveground insect control focus against ear-feeding pests for cleaner ear and improved grain quality. Offers protection against a broad spectrum of pests. Contains 95% Bt with three modes of action aboveground (HX1, YGCB, AVBL) blended with 5% in-the-bag non-Bt	Contains integrated refuge. But in cotton-growing areas, 20% separate, non-Bt corn borer refuge required within ½ mile	European corn borer, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm	glyphosate, glufosinate
Optimum AcreMax Leptra	Provides aboveground insect control focus against ear-feeding pests for cleaner ear and improved grain quality. Offers protection against a broad spectrum of pests. Contains 95% Bt with three modes of action aboveground (HX1, YGCB, AVBL) blended with 5% in-the-bag non-Bt	Contains integrated refuge. But in cotton-growing areas, 20% separate, non-Bt corn borer refuge required within ½ mile	European corn borer, fall armyworm, black cutworm, western bean cutworm, corn rootworm; high-level protection against corn earworm and fall armyworm	glyphosate, glufosinate

Table 1. Traits and Technologies Available for Corn Production Considering Hybrid Selections (cont.)

Technology/Trait	Description	Refuge Requirements	Insects Controlled	Herbicide Tolerance
Optimum Intrasect	Provides single-bag, multiple modes of action solution for aboveground insect protection. Contains 95% Bt with two modes of action aboveground (HX1, YGCB) blended with 5% in-the-bag non-Bt	Requires 20% structured non-Bt corn refuge in Corn Belt, but increases to 50% in designated cotton-growing counties	European corn borer, southwestern corn borer, southern cornstalk borer, fall armyworm, common stalk borer	glyphosate, glufosinate
Qrome	Provides defense against above- and belowground insect protection, including two modes of action to control corn rootworm. Major component contains the Agrisure RW trait, Bt trait, and Herculex XTRA genes	Provides single-bag refuge for both above- and belowground pests (5% blend) but still requires 20% separate refuge in cotton-growing counties within ¼ to ½mile	European corn borer, fall armyworm, black cutworm, southwestern corn borer, corn earworm; high-level protection against corn rootworm	glyphosate, glufosinate
Herculex I	Offers consistent control of aboveground insects for areas with minimal rootworm pressure. Bt-based, protecting against European corn borer, fall armyworm, and western bean cutworm	20% of total corn acres must be planted to non-Bt hybrid within½ mile	European corn borer, fall armyworm, western bean cutworm, low-to-moderate rootworm pressure	glufosinate
Herculex XTRA	Offers consistent control of above- and belowground insects. Offers protection against European corn borer, corn rootworm, fall armyworm, black cutworm, and western bean cutworm	Requires 20% structured non-Bt corn refuge in Corn Belt, but increases to 50% in designated cotton-growing counties	European corn borer, corn rootworm, fall armyworm, black cutworm, western bean cutworm	glufosinate
YieldGard Corn Borer	Provides insect control against aboveground pests. Utilizes Cry1Ab protein	Requires 20% structured non-Bt corn refuge in Corn Belt, but increases to 50% in designated cotton-growing counties within ½ mile	European corn borer, southwestern corn borer, fall armyworm	glyphosate, glufosinate

Table 1. Traits and Technologies Available for Corn Production Considering Hybrid Selections (cont.)

Technology/Trait	Description	Refuge Requirements	Insects Controlled	Herbicide Tolerance
Roundup Ready	Contains in-plant tolerance to Roundup brand herbicides, allowing growers to spray Roundup brands over the top, from planting through the V8 stage or 30-inch corn height, with excellent crop safety. Inhibits enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS)	N/A	N/A	glyphosate
Liberty Link	Provides in-plant resistance. A nonselective, postemergence herbicide that provides relatively quick contact action on many tough grass and broadleaf weeds. Inhibits enzyme glutamine synthetase	N/A	N/A	glufosinate
Enlist	Offers tolerance to 2,4-D, glyphosate, glufosinate, and FOPS. A postemergence application with low drift/volatility. Acts as synthetic auxin causing unregulated growth	N/A	N/A	glyphosate, glufosinate, 2,4-D, FOPS

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