Seed selection can be a challenge

Unless some unknown event occurs, area grain farmers can expect another tough year to make a profit.

Farmers cannot control grain prices, but they can examine their planting costs and try to reduce expenses to improve their balance sheet.

One of the major cost items is seed, particularly corn seed. Corn seed continues to increase in price, especially with all of the biotechnology traits added over the past decade.

All of these traits are from genetic engineering, commonly called GMOs — genetically modified organisms. Another name for GMOs is transgenic crops.

Corn seed that does not have the biotechnology traits is generally non-GMO corn. Farmers can grow non-GMO corn, but if a pest occurs, control becomes a more difficult challenge. Alternative control methods are often more expensive than the extra seed cost for the GMO trait. And if the alternative control methods are ineffective, it can cause significant yield loss.

In addition, farmers are concerned that seed companies have put most of their research effort into biotechnology corn hybrids, including selection for yield, and have put less development money into non-GMO corn.

Thus, to get the highest-yielding genetics, a farmer has to use the GMO corn whether they need the special traits or not.

However, Ohio State University Corn Performance Trials have shown that under Ohio conditions, many non-GMO hybrids have been competitive with GMO hybrids as long as certain insect and weed pests were not present.

As a result, some farmers may reduce their seed costs by using non-GMO hybrids and being prepared to use alternative pest management programs. In addition, a farmer often can get a small premium for non-GMO grain.

To make these decisions, a farmer needs to ask, do I need the GMO traits? The following discussion is a review of the traits that a farmer may consider:

Before the discussion, one needs to know the definition of GMO. In a GMO product, a gene has been incorporated in the crop from another organism. In most cases, the genetic material has come from a bacteria. For example, the first corn GMO was Bt corn — Bt stands for the bacteria Bacillus thuringiensis.

Scientists incorporated genetic material from the Bt bacteria that produce a protein that kills the larvae of certain moths, such as the European corn borer. It does not affect other insect groups, such as bees. European corn borer larvae die when they feed on corn tissue that has the Bt gene in it.

Mycogen Seeds, in partnership with Ciba Seeds, released the first Bt-corn hybrid in 1996. Before Bt corn, European corn borer was the number one pest in corn production and farmers had to apply large amounts of insecticides to control it.

Bt corn provided a much better control program, greatly reducing the amount of pesticide sprayed or a field, and only affecting certain insects.

European corn borer was not a regular pest in Ohio like it was in Iowa. Outbreaks would occur but five years or more may have separated the outbreaks. Since the release of Bt corn, European corn borer populations have been greatly reduced.

A farmer may decide he does not need Bt corn, but if an outbreak occurs he will have to apply an insecticide before the larvae enter the plant. Once in the plant an insecticide will not work. This will require farmers to diligently scout fields and spray timely.

I can speak from experience scouting cornfields in the summer heat is one hot, sweaty, and unpleasant task.

LibertyLink, released in 1997 by AgrEvo, was the next GMO.

The gene in LibertyLink allowed corn plants to be tolerant to glufosinate herbicide. This technology did not take off because, at the time, LibertyLink hybrids yielded less than other corn hybrids.

However, a year later, Monsanto released another herbicide-tolerant crop — Roundup Ready corn. It included the Bt trait. Since it had two traits, it was often called stacked corn.

Since the release of the first Bt corn, additional Bt genes have been incorporated that control other moth larvae, such as western bean cutworm, armyworms, and earworms.

Roundup Ready corn was tolerant to glyphosate, an effective broad spectrum post-emergent herbicide, especially on grass and perennial weeds.

However, Ohio farmers have other herbicides that work on those weeds, even though they may be more expensive and require timely application. Thus, depending on the weeds present, a farmer can get by without this trait in their corn.

Monsanto released the next GMO in 2000 — YieldGard Rootworm Corn. It was a Bt type that was effective against corn rootworms. Corn rootworms were a major pest, particularly for farmers growing corn after corn. Insecticide treatments had to be soil-applied at planting and were even more toxic to handle than other insecticides. There was no rescue insecticide that could be applied later in the season.

However, corn rootworms are often not a problem in Ohio since farmers tend to rotate plantings between corn and soybeans. Soybeans break the rootworm cycle. Generally, only the livestock farmer that needs corn for grain and silage may grow corn after corn in our area.

The rootworm trait is often stacked with the European corn borer Bt and the glyphosate-tolerant trait.

A hybrid genetically engineered for drought tolerance was first released in 2013 as DroughtGard. Its use has been more popular in the drier West than in Ohio. University data has shown it may have a yield advantage in drought years, but how often does Ohio have a severe drought?

Today almost all genetically engineered corn hybrids will have some type of Bt gene stacked with one or all of the herbicide-tolerant traits. University entomologists have developed a table that lists products available by trade name and identifies what pest is controlled by each product. The table may be found at the following website: https://bublock.tamu.edu/files/2011/12/BtTraitTable20Dec2017.pdf.

Recently, other genetically engineered corn has been developed for resistance to additional herbicides, such as 2, 4-D and “ion” chemistry. However, these products have not become commercially available in our area.

Seed costs have gone up significantly since the first genetically engineered corn hybrid was commercially released. Farmers have to decide whether the increased seed cost will provide a good return on investment.

Non-GMO corn can be grown today, but requires more management to control all pests. Farmers have a limited number of non-GMO hybrids available and their yield potential is debatable. If the pest does not occur, non-GMO seed will be adequate, but one cannot predict when a pest or outbreak may occur.

Farm decisions are always a challenge since farmers do not know what the weather will bring each growing season. It is even more of a challenge this year with low grain prices. Seed selection is only one of the decisions a farmer has to make in an attempt to be profitable.