

Mid-February 2003

Farm Journal

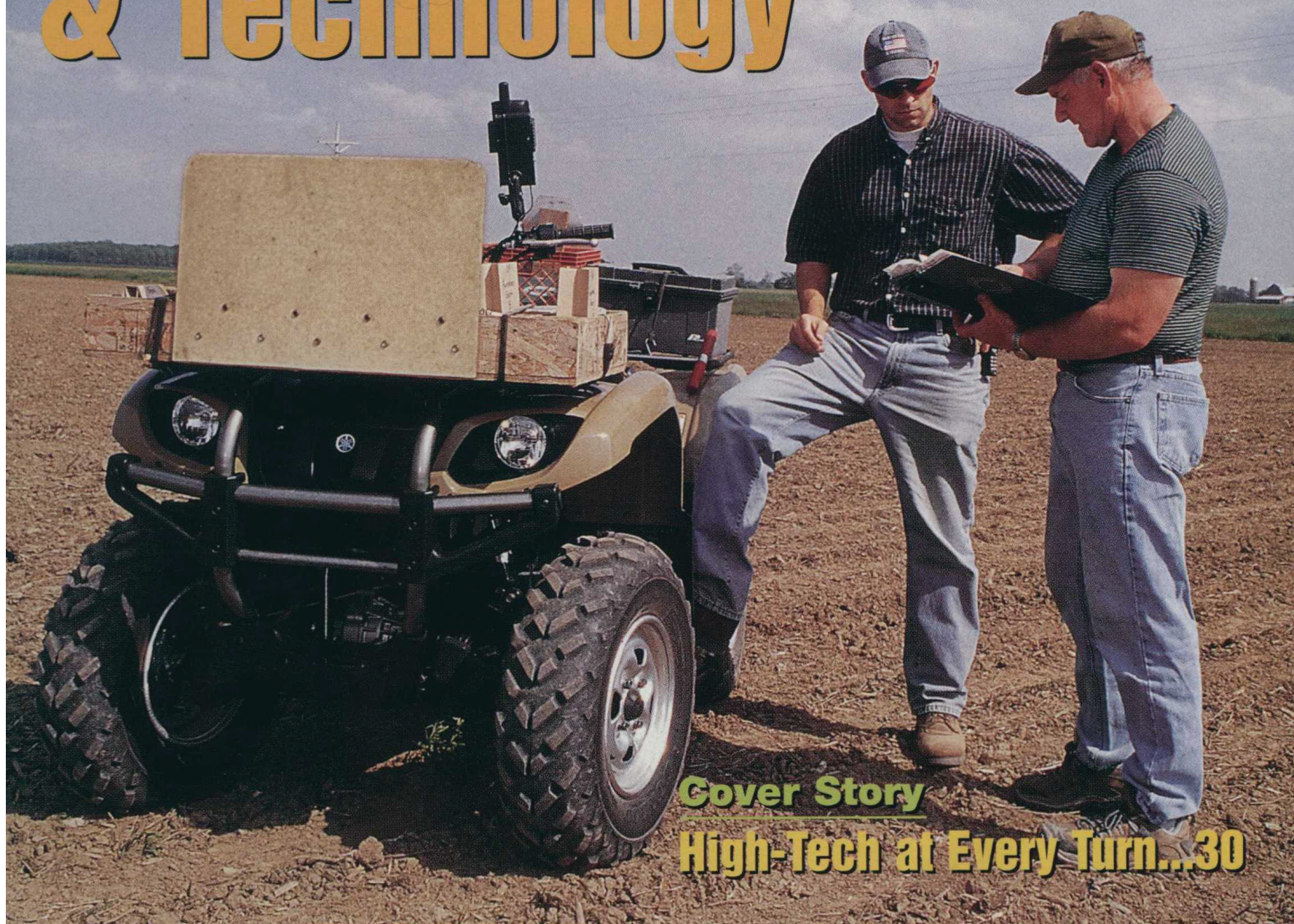
The Magazine of American Agriculture

Machinery & Technology

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Cover Story

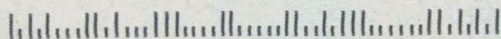
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Retired accounting teacher Doug Rupp, left, works with employee Greg Gigax to ensure new technology makes sense for his farm's bottom line. See "Technology Pays Off" by Darrell Smith, on page 30.



PHOTO: GREG TOMLINSON

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New meter options for corn, and liquid starter attachments are the focus in "New Meters on the Market" and "Ready, Set...Flow." By Charlene Finck

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ILLUSTRATION: MARK COLLINS

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On our cover

A GPS-equipped ATV aids Ohio farmer Doug Rupp, right, and consultant Bill Bauer as they collect soil samples. Photo: Darrell Smith

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Seed Corn Assembly Line

The new models will be loaded with features

By Andrew Burchett

Remember when pickups with automatic transmissions, air conditioning, FM radios and cup holders were considered loaded?

Today's standard features are yesterday's luxuries. The added features cost more, but buyers are willing to pay. That's where seed corn is going in the next three years.

The bottom line is that the industry is about to offer farmers more options than before, making the number of possible combinations mind boggling. Instead of features, the talk is of traits and treatments. A set of traits is a stack. And yes, seed prices will jump as more technology is added.

In the future. "In 10 years, a seed rep will be working on a seed order with a farmer, and they will discuss a number of trait stacks," says Jim Miller, vice president, crop genetics research and development, for Pioneer Hi-Bred International Inc., a DuPont company. "One trait stack could be resistance to European corn borer and corn rootworm, herbicide resistance, drought tolerance, recommended population of 45,000 plants per acre and high starch content for increased ethanol production—all in a hybrid with an average yield of 200 bu. per acre."

In a decade, the stacked corn hy-

brid Miller describes may be no big deal. In fact, there may be hundreds or even thousands of stacked seed products offered.

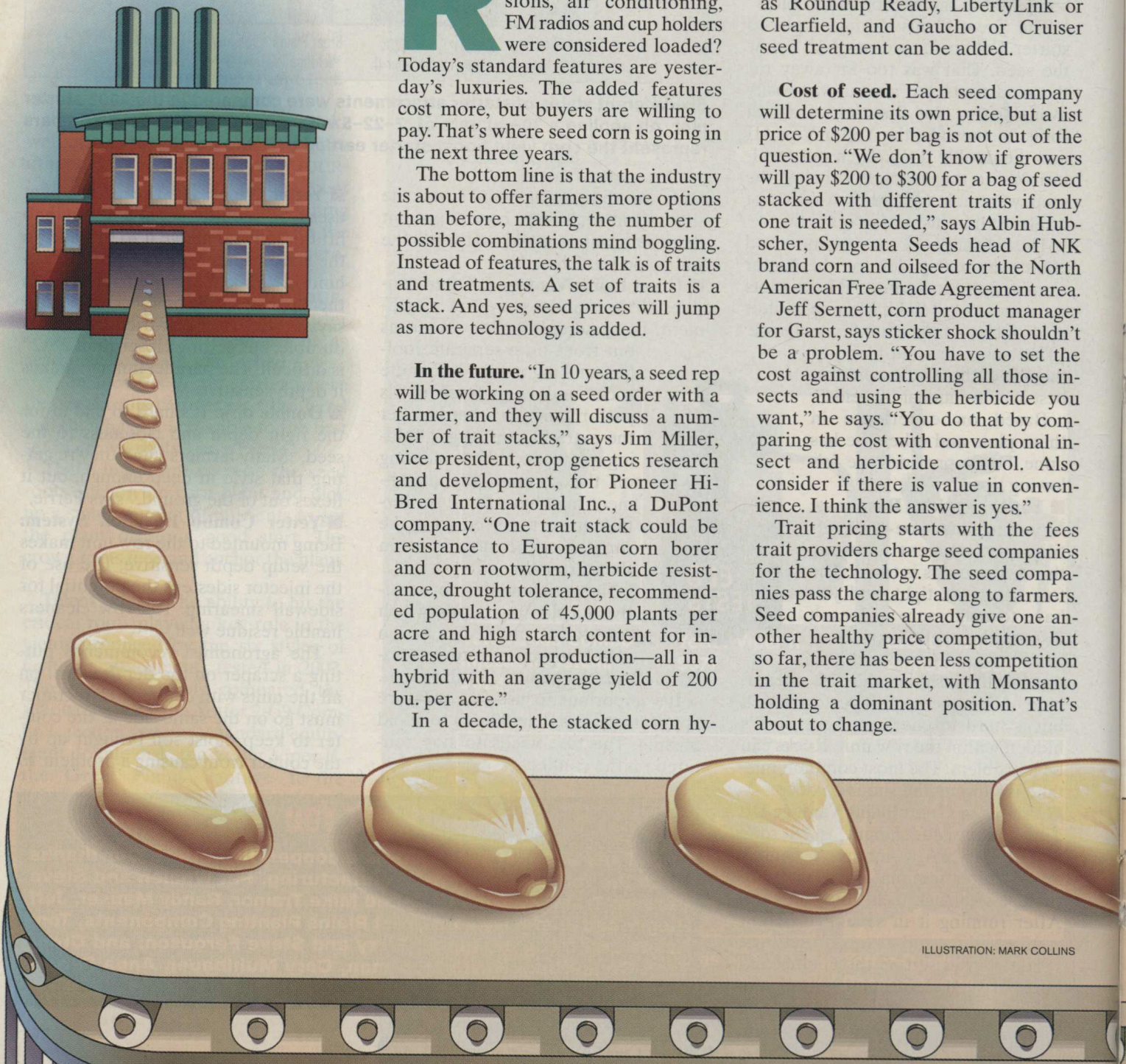
This could be the year that stacked seed traits take off, if the Environmental Protection Agency (EPA) gives regulatory clearance to Monsanto's YieldGard Plus corn—a new Bt trait combination for corn rootworm and European corn borer protection. If registered this year, the stacked trait seed would be available next year. Bt traits can be stacked with a herbicide resistance trait such as Roundup Ready, LibertyLink or Clearfield, and Gaucho or Cruiser seed treatment can be added.

Cost of seed. Each seed company will determine its own price, but a list price of \$200 per bag is not out of the question. "We don't know if growers will pay \$200 to \$300 for a bag of seed stacked with different traits if only one trait is needed," says Albin Hub-scher, Syngenta Seeds head of NK brand corn and oilseed for the North American Free Trade Agreement area.

Jeff Sernett, corn product manager for Garst, says sticker shock shouldn't be a problem. "You have to set the cost against controlling all those insects and using the herbicide you want," he says. "You do that by comparing the cost with conventional insect and herbicide control. Also consider if there is value in convenience. I think the answer is yes."

Trait pricing starts with the fees trait providers charge seed companies for the technology. The seed companies pass the charge along to farmers. Seed companies already give one another healthy price competition, but so far, there has been less competition in the trait market, with Monsanto holding a dominant position. That's about to change.

ILLUSTRATION: MARK COLLINS



As if a cog in the biotechnology machine has become unstuck, several companies expect new traits to arrive in the next few years. This year, the new generation Bt trait Herculex I will be in farm fields. Developed by Dow AgroSciences and Pioneer Hi-Bred, it goes beyond European corn borer resistance to add black cutworm and fall armyworm resistance. It also includes the LibertyLink trait.

Monsanto's YieldGard Rootworm will be out soon, but faces competition from another corn rootworm-resistant trait from Dow AgroSciences and Pioneer Hi-Bred as early as 2005. Syngenta has a variety of insect protection traits slated to arrive in a few years as well as a glyphosate-resistance trait to compete with Monsanto's Roundup Ready corn.

Quality traits, such as low-phytate and nutritional enhancements for animal feed and highly fermentable starch content for ethanol production, also are in the works. For the most part, these traits represent incremental improvements for end users. Input traits are part of the crop protection market, where competition is stiff.

"Trait developers compete to improve upon technology. Seed companies have access to more traits, and more trait providers are competing for their business," says Tom Wilttrout, general manager, North American seeds business, Dow AgroSciences.

Take your pick. "The new competition is good for seed companies and farmers who want to get the best combination of price and performance," says Ron Wulfskuhle, vice president of marketing and sales for J.C. Robinson Seeds, a Golden Harvest company. But the number of hybrids, trait combinations and seed treatments will be a challenge to manage. "Soon we will have to be able to han-

New Product Line Schedule			
	2003	2004	2005-06
European corn borer resistance			New trait from Syngenta
Broad lepidopteran control (corn borer + others)	Herculex I from Dow AgroSciences and Pioneer Hi-Bred includes the LibertyLink trait from Bayer CropScience— <i>on time</i>		New trait from Syngenta
Corn rootworm resistance	YieldGard Rootworm from Monsanto— <i>approval pending</i>		New trait from Dow AgroSciences and Pioneer Hi-Bred New trait from Syngenta
Herbicide resistance			Glyphosate resistance from Syngenta
Seed treatments	Cruiser from Syngenta— <i>on time</i>	Poncho from Gustafson	
Planned stacks*	YieldGard Rootworm with Roundup Ready from Monsanto	YieldGard Plus (corn rootworm and corn borer resistance) from Monsanto	YieldGard Plus with Roundup Ready from Monsanto— <i>2005</i> Herculex I with corn rootworm-resistant trait from Dow AgroSciences and Pioneer Hi-Bred
*Other trait stacks may be made through agreements among technology providers and seed companies.			

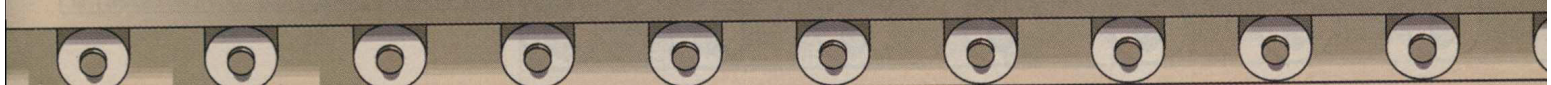
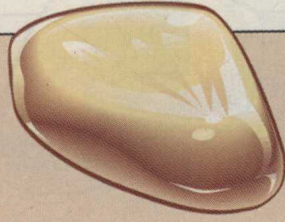
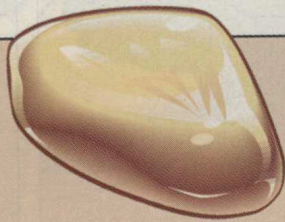
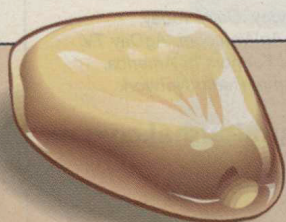
Seed companies already offer Bt corn stacked with herbicide resistance, and seed treatment use is up. Several more traits and seed treatments for corn will arrive this year and in the near future, to be offered singly or stacked. Monsanto plans to introduce a new stack each year through 2005.

dle up to 10,000 [different products]," says Wulfskuhle.

It will be expensive to carry multiple combinations of traits. Having the combinations that farmers want requires seed companies to carry more products, increase cost of supply and, eventually, discard leftovers, explains Hubscher at Syngenta.

Seed inventory management issues may not seem like a farmer problem, but those who want a specific product may have to order earlier than usual to get the desired trait combination.

Robb Fraley, vice president and chief technology officer for Monsanto says the problem can be minimized. "The industry needs to model basic



production systems around standard stacks. In cotton, we see 75% of the seed has both Roundup Ready and Bollgard traits. Ultimately, that's the way to go in corn," he says.

Performance matters. Seed companies will have to make a few choices. "Every seed trait is not going to be sold by every seed company," says Sernett at Garst. He also notes that new traits are wonderful tools, but they only make the seed that much more important. With so much technology wrapped up in seed, farmers will want to be sure it performs.

Wulfkuhle says sometimes a trait-hybrid response causes a hybrid to perform differently than expected. That means some hybrids may not be available with certain traits. It is also tricky for plant breeders to put multiple traits in a hybrid.

Protecting new seed value will lead to another addition to the package of technology applied to seed. "We expect the Bt trait for corn rootworm to drive the demand for seed treatment," says Mark Jirak, Syngenta crop manager for seed treatment. He expects the seed treatment insecticide market to grow by 50% in 2003.

Syngenta recently received a label for the use of Cruiser seed treatment on corn, and Jirak expects the treatment to be popular. Two different rates of the seed treatment will be available for the corn rootworm Bt market, he says. A lower rate will defend against seedling pests such as wireworm, seed corn maggot and white grub. This will complement the new Bt product's defense against corn rootworm.

For farmers who don't want to apply liquid or granular insecticides on mandatory non-Bt refuge acres, a higher rate of Cruiser's active ingredient will defend the plant against

seedling pests as well as corn rootworm. In the fall of 2003, Syngenta will offer a formulation called Cruiser XL. It will combine Cruiser with Maxim XL fungicide, which holds a 93% market share in seed corn.

Syngenta's new offering will have to compete with Gustafson seed treatments. Gaucho has been popular as a seedling pest treatment and Prescribe has been on the market for corn rootworm. A new Gustafson treatment called Poncho, which will also be available in high and low rates, is expected to be registered in 2003.

Seed companies will likely pick one brand of seed treatment to sell. Farmers choose whether to order it or not.

So far, customer preferences for transgenic corn traits such as Bt and Roundup Ready have been modest. In 2002, USDA's acreage report showed 34% of planted corn contained one or more biotech traits. About 9% was herbicide resistant, 22% insect resistant and only 2% stacked with herbicide- and insect-resistant traits.

Jump in sales. Seed companies, however, report a remarkable increase in orders for biotech corn this year. Even in Illinois, where there is a concentration of grain exporters and processors that won't buy corn with certain transgenic traits, demand has increased. "Bt sales are up sharply outside the areas around a few major processors," says Bill Dennis, sales manager for Thorp Seed Company.

It's unlikely that new biotech traits will be approved any time soon by the European Union. This, in combination with worries about weed resistance developing in fields where glyphosate-resistant crops are planted continuously could be the limiting factor for adoption of the fully loaded corn hybrids of the near future. **FJ**

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