Protect That Seed!

Flower and vegetable seeds, while a valuable commodity, have few protection options compared to other agricultural seed. Companies are working to remedy that, coming up with new techniques.

By Ellen C. Wells

SEEDS ARE TRULY REMARKABLE PACKAGES. Some seeds require stomach acids, grinding gullets – even fire, in order to germinate. In the world of agriculture, growers can't wait for nature to coax their seeds to life and are eager for solutions to keep their seeds viable.

Seed technology companies recognize growers' needs for a uniform stand of healthy seedlings and are continually developing new products to that end. According to Kyle Rushing, Vice-President Integrated Product Research for Incotec, vegetable and flower seeds pose a different set of challenges compared to row crops. For example, dormancy issues and the variety of pathogens can be much more detrimental in the establishment and early production of the crop. Add to this the new pathogens emerging annually and the steadily growing demand by consumers for organic products, and you'll see the seed technology specialists are possibly busier than ever, researching and releasing new products for the protection and enhancement of flower and vegetable seed.

Minor Challenge

As with crop protection chemistries, growers of minor crops such as flowers and vegetables have a limited number of seed protection options available to them. "Generally the major crops are those that the agricultural chemical companies target initially," says Gordon Jamieson, Technical Director for Germain's Technology Group. "It makes sense for them: the bigger the volume, the higher the value. Those are the ones that tend to get registered first."

"Most of the chemical companies spend money to get products approved for the large end-volume users of those products," says Rushing. Both he and Jamieson note that their companies help bring solutions to the marketplace for more modest crops by working closely with IR-4, the USDA project that helps ensure pesticides are registered for minor crops.

Trends in Conventional Seed

For conventional agriculture, seed technology is trending toward researching and releasing chemical treatments and protections. Matthew Terra, Seed Technology Business Manager with Harris Moran Seed Company, says the company is offering treatments that will have two to three active ingredients, referring specifically to the FarMore Technology developed by Syngenta. "Some of that treatment will last 30-40 days once the seed germinates, and it can save a grower one or two sprays," he explains. "Nowadays the less pesticide you apply to the plant, the better. In the long run, it's more cost-effective for the grower through the growing season." According to Terra, other new technologies, like x-raying seed and infrared, have a history in Europe but haven't caught on in the U.S. because of their expense.

Harris Moran is currently trialing three new pellets with updated technologies, Terra says, and results so far have been impressive. Harris Moran is looking forward to launching these new pelleting technologies mid-2007.

Jamieson sees seed technology as a triad of seed-size

"People are becoming more aware of the importance of microbial ecology."

– Gordon Jamieson

standardization (pelleting), seed protection (conventional and organic protection products), and the emerging technology of seed disinfection, the removal of microbial pathogens from the seed itself. Many of the vegetable crops, he notes, are short-cycle crops and are being grown intensively. This makes disinfection and disease control important areas of product development for these crops. "People are becoming more aware of the importance of microbial ecology," Jamieson says, "and there are techniques that will start to clean seeds" of these pathogens without damaging the seed's viability, vigor or shelf life. He points out adding beneficial micro-organisms to the seed itself will become progressively more important.

GTG is in late stage development of a technology for the removal of pathogens, and is just beginning test marketing. Other new items are a new priming technique, Xbeet, for sugar beets, which has had a limited launch this year in the U.S. GTG has also improved its Emergis priming technology for celery and is trialing it for lettuce, carrots and other crops. The company is also adapting its polymer and coating technologies used in row crops and trialing them for horticultural crops.

"Growers are asking for products that make their lives easier," says Jayson Force, Senior Product Manager of Seed at Ball Seed Company. Ball's Slick Seed product has a special coating that allows the seed to move more smoothly through automated sowing machines, reducing sowing time and keeping machines from clogging. Genesis II pansy seed expands the range of conditions where seed can germinate, letting growers grow in higher heat with faster growth. "Our newest introduction is Ball Controlled Growth seed, and it involves applying the plant growth regulator A-Rest directly to the seed, controlling seedling stretch while reducing or eliminating the need for the grower to use PGRs at later stages in production," says Force. "All of these technologies are meant to make the grower more efficient and more successful with our products."

Organics

Development of organically approved seed is the industry's latest challenge. The USDA's National Organic Program standardizes the requirements for growers in becoming certified organic. Under NOP, no synthetically-derived materials can be used in the production of organically grown crops. This includes materials and processes used to produce organic seeds. Rushing notes that organic is the industry's buzz word, with demand for certain organic crops increasing. He adds there aren't many organic seed options available now, but Incotec and other companies do have some organic products under development.

Most of the clays and other materials used to pelletize seeds are synthetically derived therefore not organic. Harris Moran's Naturecoat pellet has been approved by the Organic Materials Review Institute for use by organic growers, and testing shows its quality is comparable to non-organic pellets. "It's one of the few OMRI-approved pellets, and it's a nice addition to an organic program," says Terra. "There was a demand for an organic pellet, so Harris Moran stepped up to create something for that demand. It's taken off quite nicely."

Disinfection treatments for seeds are available, and include hot water, steam and chlorine in limited amounts. Lindsey du Toit, Vegetable Seed Pathologist at Washington State University, says these techniques are complicated due to the varying sensitivity from crop to crop. For organic seed fungicides, she says, there's been an increase in both public and

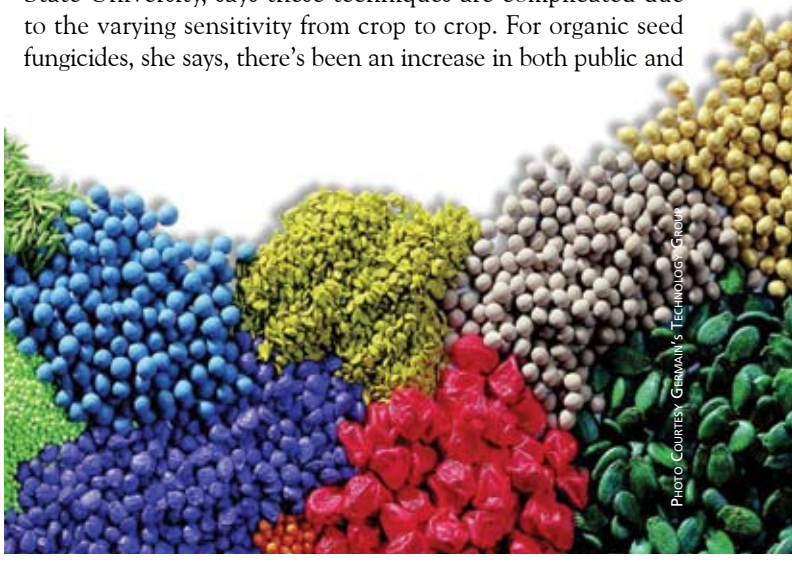

Photo Courtesy Germain's Technology Group

PHOTO COURTESY BALL HORTICULTURAL COMPANY

Marigold Slick Seed has a coating that allows the seed to move more smoothly through automated sowing machines.

private research. "There's an urgent need for these products," she says. "The difficulty organic growers face is knowing what data (from manufacturers) they can trust or what data is reliable enough for them, and there are many options available." To that end, du Toit and a WSU graduate student will be evaluating organically approved seed products to see which are effective. The researchers hope to release their data by the end of 2007.

GTG groups its organically approved seed technology under the brand name ProBio. "The challenges are the same," Jamieson says. "We want to improve the shape of the seed, provide some means of control of pathogens. Growers are still looking for a means of disease control if not allowed to put active controls on the seeds." Jamieson says GTG carefully selects "recipes" and presents them to U.S. and European certifying agencies for organic approval. "Once they are approved we have to demonstrate we can get the desired performance and at a commercially acceptable level." SW

Seed Technology Basics

Pelleting – helps form uniformly-sized seeds. It is especially helpful when planting crops with small seeds. Multipelleting is a process unique to the bedding plant industry, says Jayson Force, Senior Product Manager for Seed at Ball Seed Company. "Many flower crops produce a better end-product when they are sown several per cell," he says.

Encrusting – increases the weight and density of a seed and also helps precision planting and uniformity, as well as aids seed flow through a planter.

Priming – "jump starts" seed prior to planting by hydrating the seed which starts the germination process internally. Once planted, the seed is that much more ready to send out its roots. Priming seed brings about a more uniform germination across the crop, but does decrease the seeds' shelf life.

Protection from pests – Lindsey du Toit, Vegetable Seed Pathologist at Washington State University, explains there are two reasons to protect seeds: "The reason seed is treated in agriculture, whether conventional or organic, is to try to clean up seed if it's carrying pathogens or to protect the seed in soils where pathogens are present," says du Toit. Treatments differ, she says, depending on those objectives.