



Look For UNH Vegetables In Garden Seed Catalogs

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DURHAM, N.H.- It's January, bleak and cold. The garden is buried under a crust of ice. Even the compost pile is freezing. Then one bright morning there is a hint of thaw and, like a wish come true, there in the mailbox is the first seed catalog.

In the first weeks of the New Year, gardeners will receive an array of seed catalogs, all with vivid photos of the newest flower and vegetable varieties. It's a sure bet that most catalogs will carry at least one melon, squash, pumpkin or gourd developed at the University of New Hampshire.

J. Brent Loy, professor of plant biology and genetics at UNH, is internationally recognized as a classical breeder producing top quality hybrids. In his 40 years of research at UNH, he has developed cultivars that now are common names in seed catalogs: Earligold, Earliqueen, Goddess, Strike, Halona and Passport melons; Racer, Gold Medal, Gold Challenger, Prankster, Pik-a-Pie and Snackjack pumpkins; Thunder and Autumn Cup buttercup squashes; and Goblin and Koshare gourds.

UNH has licensed more than 40 of Loy's varieties to commercial seed companies and, since fiscal year 2001, has received more than \$500,000 in royalties. Loy uses his portion of the royalties to sustain his research program. Each project takes years of painstaking cross-breeding and cultivation. One example is Slick-Pik™ YSN260, a yellow straight-neck squash, which should debut later this year. "When this hits the industry, it will be big," he said.

YSN260 is a "glabrous" yellow summer squash with shiny, smooth leaf stems; all other yellow varieties have bristly spines on the stems which make picking the fruit and handling the plant a painful chore, and causes severe abrasions to the tender skin of the fruit. "I found this mutant 15 years ago," he said. "I had a small plot of an open-pollinated summer squash cultivar, and the mutant showed up in two out of six plants."

To preserve the trait, Loy began a controlled pollination program, a particularly labor-intensive operation in squashes, which have both male and female flowers. The flower buds must be tied off the day before they open. The next day the flowers are opened and pollen from a selected male flower is sprinkled onto the reproductive part of the female flower. The female flower is then closed with a twist-tie to prevent cross pollination by bees. These flowers grow into mature squash fruit and the seeds are extracted and planted to produce the next generation.

To develop a uniform inbred breeding line, this process has to be repeated for the plants that show the most uniformity of the desired trait (spineless stems in this case). By the fifth generation Loy has a plant that is nearly 100% homozygous (genetically uniform) for that quality and can be used for making hybrid seed.

"The majority of commercially desirable traits are recessive," he said. "Sometimes by F4 (third generation) breeding lines look pretty good, so by F4 or F5 I'm making experimental hybrids for quality traits." "With some cucurbits, such as melons and summer squash, an extra

generation can be grown in the greenhouse, so that it takes only two years to produce four generations. Otherwise, only one generation is produced a year.

Often, a uniform inbred strain (F4 or F5) does not have all the desired traits that are needed for commercial acceptability, so it has to be crossed with another strain which has particular desirable traits, such as compact growth, bright rind color, or disease resistance, and this starts another cycle of breeding and selection. It takes years to create a top-quality hybrid and that is what Loy does so well. Seed catalogs often cite him as breeder of their new varieties.

Rob Johnston, president and founder of Johnny's Selected Seeds of Winslow, Maine, has worked with Loy for 30 years. "A lot of plant breeding is being an artist, being able to envision and see the results," said Johnston. "Brent is not only a geneticist, but he projects the future, by envisioning where he wants to go with his breeding program."

The UNH Office for Research Partnerships and Commercialization (ORPC) has helped Loy translate his research into funding to underwrite field work. "I am currently licensing four to eight new varieties every year to several seed companies, a huge undertaking that would be impossible to implement without the assistance of ORPC," said Loy.

Hollar Seeds in Colorado, a global distributor, has exported the Passport melon to Uzbekistan, Bulgaria, Serbia and Moldova, and ships the Neon pumpkin to Canada, Germany and England. Other licensees include Rupp Seed, Seneca Vegetable Research, Hybrid Seeds of New Zealand, Seminis Seeds and High Mowing Organic Seeds.

Loy delivered a series of lectures last year at an international conference in China and encouraged researchers there to seek ways to safeguard their intellectual property. "If you can't make intellectual property agreements, it stifles sharing of germplasm," he said. "It sometimes makes it more difficult but on the other hand, it protects me. If I have some select breeding lines, I cannot give these outright to a seed company."

Johnston, of Johnny's Selected Seeds, said, "Royalties make sense to me. There's no risk if it's not commercially successful, but if it is successful, it can really help the breeder. It's easy for me to make up the royalty fee on a pack of seeds."

"Working with seed companies is really a delightful and rewarding aspect of my job," said Loy. "Breeders, product managers, and marketing personnel at seed companies are personable, extremely knowledgeable. They give me tremendous assistance in determining the direction of my breeding programs, and in promoting my work so that my varieties end up in vegetable catalogs and are available to growers. Hopefully, it is the consumer at the end of the food chain who benefits the most."

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Photos available to download:

<http://www.unh.edu/news/img/loy/brent.loy.jpg>

<http://www.unh.edu/news/img/loy/gourds.jpg>

<http://www.unh.edu/news/img/loy/slickpik.jpg>

CREDIT: Perry Smith, UNH Photo Services

Brent Loy, professor of plant biology and genetics at UNH, is world famous for his varieties of pumpkins, squashes, melons and gourds.

Slick-Pik™, a new variety of yellow squash developed by UNH professor Brent Loy, has smooth stems, making it easier to pick and preventing damage to the squash.

Starting with a standard white "egg" gourd 11 years ago, Loy created the "Goblin" with colors and patterns.

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