Research Profile:
James Brent Loy - Plant Breeder Extraordinaire

To gardeners and farmers, Gold Medal, Halona, and Honey Bear are names that mean their vegetables will be more flavorful, nutritious, and resistant to diseases. But to J. Brent Loy, they represent just another day at the office - they’re just a few of the hybrid varieties of vegetables now available as the result of his research, breeding, and testing.

These vegetables that are “winners” on the farm also have made Dr. Loy a winner in his own right. In 2009, he received the All-America Selections Breeders’ Cup Trophy. Then, in 2010 and again in 2011, Loy was selected as one of five finalists for the Distinguished Agriscience Scientist of the Year Award presented by the Christopher Columbus Fellowship Foundation and the American Farm Bureau Federation.

The Distinguished Agriscience Scientist of the Year recognizes a senior scientist who is making, or has recently made, significant and positive contributions in the field of agriscience. Known for his work in plant breeding, agricultural plastics, and crop physiology, Dr. Loy was a top contender.

According to Loy, although the awards and formal recognition of his work are gratifying, his sense of satisfaction comes from the success of his fruits and vegetables for the sake of farmers everywhere. While his focus is on the improvement of local crops, his work also has helped farmers throughout the New England region and, in the case of his melons and pumpkins, around the world.

During his time as a professor in the UNH College of Life Sciences and Agriculture (COLSA), Loy has utilized the resources at the New Hampshire Agricultural Experiment Station, and worked closely with private seed companies to yield the best results in his field. “A big part of my enjoyment,” Loy says, “comes from helping these seed companies.”

Loy’s success is rooted in his enjoyment of the plants he works to improve. Loy reveals that, “You have to have a love of plants and the extraordinary genetic variability in plant traits. There are only a small percentage of people that get into it because you almost have to have a spiritual relationship with the plants you grow.” And, through his relationship with these plants, he has developed over fifty hybrid varieties of melons, squash, gourds, pumpkins, and tomato currently marketed commercially, as well as novel row vegetable crop cover and mulch systems used by growers throughout North America.

Loy not only has a commitment to the excellence of his plant breeding, but also to his students. “I’m very dedicated to providing
practical, hands-on application in the courses,” says Loy. This philosophy undoubtedly stems from his excitement for farming that started at a very young age. “When I was 6 or 7 years old, I knew I wanted to be a farmer,” Loy recalls, “and when I was big enough, I got a job on a farm.” Now, Dr. Loy passes his knowledge and passion for the field on to his students.

“A lot of our students have a romantic idea about agriculture,” he remarks, “but it’s really hard work.” Enthusiasm is a critical factor to the success of this type of research, but so is commitment. “You have to have a lot of patience,” Loy says. “Some things take years and years to develop.”

The impact of his research provides ample evidence of the commitment and enthusiasm Loy brings to his work. His passion for discovery and development will keep growing for years to come, too, because, when it comes to his work, Dr. Loy is “always thinking into the future.” No doubt, plant growers in New Hampshire, New England, and the world can look forward to more innovative plant varieties to result from the continuing work of this award-winning scientist.

Just what goes into developing an award winning hybrid?

Each project takes years of painstaking crossbreeding and cultivation. One example is Slick-Pik™ YSN260, a yellow straight-neck squash that debuted in seed catalogs in 2008.

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. Its development started when Loy found the mutant 18 years ago in two out of six plants in a small plot of an open-pollinated summer squash cultivar.

To preserve the trait, Loy began a controlled pollination program. In this labor intensive operation, female flower buds were tied off the day before they opened. The next day the flowers were opened and pollen from a selected male flower was sprinkled onto the reproductive part of the female flower. The female flower was then closed with a twist-tie to prevent cross pollination by bees. These flowers were allowed to grow into mature squash fruit and the seeds were 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, the plant is nearly 100% homozygous (genetically uniform) for that quality and can be used for making hybrid seed. It takes at least 5 growing seasons to reach this stage.

Often, a uniform inbred strain does not have all the desired traits that are needed for commercial acceptability, so it has to be crossed with another strain that has particular desirable traits, 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.

Story by Victoria Thompson and Lynnette Hentges, with contributions from Michelle Gregoire and UNH Media Relations.
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