

Origin of Rutgers **Haskin CROSBreed®** and **Haskin NEH®** Disease-Resistant Oyster Lines

Gregory A. DeBrosse
Rutgers Cape Shore Laboratory

Beginning 1960, Dr. Hal Haskin and his colleagues at Rutgers University conducted a breeding program to produce eastern oysters (*Crassostrea virginica*) for resistance to MSX-disease, caused by the pathogen *Haplosporidium nelsoni*. Six MSX-resistant lines (AOFA, ARDN, ASOLD, AVA, BLA, CXF) were developed after years of selective breeding. These lines showed strong resistance to MSX, with survival up to 10 times greater than that of unselected controls. In 1988, Dr. Standish Allen and Gregory A. DeBrosse became custodians of the six MSX-resistant lines. Epizootic outbreaks of Dermo, a disease caused by *Perkinsus marinus*, appeared in Delaware Bay in 1990 and became endemic thereafter. While these Rutgers oysters were resistant to MSX, they were not resistant to Dermo. The Dermo outbreaks provided Rutgers the opportunity to subject their MSX-resistant lines to a constant Dermo-disease pressure and to select for Dermo resistance, although the MSX-resistant lines showed signs of inbreeding which needed to be corrected before further improvement was possible. Therefore in 1992, we initiated a dual-resistance breeding program using the Rutgers MSX-resistant lines as the founder population (parent stock) to produce two new synthetic lines with restored genetic diversity and with different genetic origins.

The first geographic line was produced by crossing three MSX-resistant strains originating from the mid-Atlantic (BOF, DF, XOL) and a wild stock from Delaware Bay. It was labeled the “DBHSRL” (Delaware Bay High Survival Resistant Line), and was used in an ongoing, multi-University selective breeding program (CROSBreed Project) funded by the Sea Grant ODRP program from 1995 through 2006. In 1998, the name was changed to the “CROSBreed” line in recognition of the ongoing support received by this program. In 2000, the U.S. Patent and Trademark Office issued Rutgers University a trademark for the “**Haskin CROSBreed®**” line.

The second geographic line created in 1992 was produced using two succeeding generations (BLA, CLA) of the Long Island derived Rutgers MSX-resistant lines, as well as the Frank Flowers Co. (NY) and Ocean Pond, Inc. (NY) varieties of Rutgers “BLA” line. This line, produced from northeastern-derived parent stocks was named the Northeastern High Survival Resistant Line (NEHSRL). The name of this line was formally shortened on February 1, 2008 when the trademark application for the name “**Haskin NEH®**” was submitted to the U.S. Patent and Trademark Office and authorized.

Since 1998, these lines have undergone further genetic improvement under the direction of Dr. Ximing Guo and Gregory DeBrosse through the addition of fast growth as a selection criteria and new genetic materials to correct inbreeding.