The US Wheat Coordinated Agricultural Project (CAP) is a multi-state, multi-institution project dedicated to the genetic improvement of US wheat through research, education and outreach.

Most of the currently grown US wheat cultivars are developed by public sector wheat breeders. The US Wheat CAP was funded by USDA-CSREES to continue and improve this great tradition by forming a network of three dozen scientists, including breeders and molecular biologists from 25 states.

The main objective of this project is to incorporate modern selection technologies to increase the competitiveness of US public wheat breeding programs. The central technology that will be incorporated in this project is called **M**arker **A**ssisted **S**election (MAS). Molecular markers are landmarks on chromosome maps that can be used to monitor the transfer of specific chromosome segments known to carry useful agronomic traits. Breeders use molecular markers to increase the precision of selection for the best trait combinations.

The research component of this proposal focuses on mapping, validating and implementing markers for quantitative traits prioritized by the wheat industry, for each of the different wheat market classes grown in the U.S. Results from this research will facilitate the manipulation of these complex traits by MAS in the near future.

This project also includes an extensive outreach component to share with growers and end-users information about the advantages and limitations of MAS. Graduate and undergraduate students will be trained in modern and traditional breeding techniques to prepare the next generation of U.S. breeders. This integrated project will provide lasting benefits to U.S. agriculture through improved varieties and germplasm and improve the ability of U.S. wheat breeding programs to capitalize on advances in genomics.

The US Wheat CAP is organized into four regional projects each led by a regional coordinator. The four regional projects collaborate with the four USDA-ARS Regional Small Grains Genotyping Laboratories.

Wheat CAP research at Virginia Tech focuses on wheat traits of critical importance to growers and end-users in the Mid-Atlantic region where diseases such as powdery mildew, leaf rust, stripe rust, and fusarium head blight result in significant losses in yield and quality each year. For example, researchers will be identifying and using DNA markers to select varieties possessing genes conferring durable resistance genes to powdery mildew, a chronic problem in the Mid-Atlantic region that causes annual crop loss of 10-30 percent. Researchers also will be identifying genes that confer superior milling and baking qualities in soft wheat.

You can learn more for this project from: http://maswheat.ucdavis.edu/