



**Amount Requested: \$800,000 USDA-CSREES Special Research Grants Budget**

***Oregon State University, Lead Institution  
Cooperating States  
Minnesota, North Dakota, Washington, and Wisconsin***

*Barley is facing a crisis.* Acreage has declined to historically low levels and the US is in danger of conceding domestic and world markets for barley, and its value-added products, to competitors from Australia, Canada, and Europe. This will have a substantial negative impact on the US economy and federal, state, and local tax revenue. Acreage decline is due to several factors. In some traditional barley production areas, corn and soybean have become dominant crops due to favorable farm policy, biotechnology, and high levels of investment by the private sector. This has pushed barley acreage into more marginal areas, where drought and heat stress are major production restraints. Throughout the US, climate change is resulting in increased abiotic (e.g., drought, cold) and biotic (e.g., disease, insect) stresses on all crops. Barley is among the most stress tolerant crops, and judicious investment in biotechnology will allow scientists to enhance this innate tolerance in order to maximize productivity, quality, and economic returns. *The barley research community needs a new special grant in order to apply the knowledge gained, and tools developed by, the Regional Barley Gene Mapping Project.*

The Regional Barley Gene Mapping Project, which supported a directed competitive grant program, funded individual projects throughout the US that provided for significant advances in genomic science, but did not provide a coordinated approach to meet this crisis. Advances in genomic research provided by the previous special grant, and other efforts, provide a unique opportunity to address this crisis through a new special grant.

*Researchers in Minnesota, North Dakota, Oregon, Washington, and Wisconsin have developed a coordinated research plan to apply genomics tools to four research areas that have the greatest potential for success to increase barley production – winter*

*hardiness; drought tolerance; disease resistance; and quality. We propose an \$800,000 annual appropriation (\$160,000 per state) for three years to support research in the five states. Most of this funding can be provided through an offset by using the current funding for the Regional Barley Gene Mapping Project.*

*What is barley and why is it important?*

Barley is a cornerstone of American agriculture. It is the most stress tolerant of cereals, producing grain essential for the malting and brewing industries. Barley is a heart-healthy grain that will be a key ingredient in strategies to reduce obesity and Type II diabetes. Barley provides superior forage and feed for ruminant and non-ruminant animals. Barley provides farmers with an option to increase genetic diversity, use less irrigation water, and to be more profitable.

*What is genomics, and why barley genomics?*

Genomics is an umbrella term defining the study of naturally occurring genetic variation using the latest tools of biotechnology. Barley is unique in that in addition to its economic importance as a crop, it is also a model genetic system. A vigorous public sector research community, in cooperation with the private sector, has developed a robust set of genomics and molecular breeding tools. These discoveries in basic biology can be extended to practical applications and to other crops.

*Why a special grant?*

This research will be supported by a tight and coordinated network of Land Grant University and ARS scientists with linkages to the private sector. These researchers are currently supported by Federal, State, and local government agencies, grower self-assessment, and industry grants. A recurring base of funds, over three years, is necessary to ensure the timely and effective application of currently available tools. There is not sufficient competitive grant funding for this type of applied molecular plant breeding and variety development. Grower and industry support is constrained by declining acreage. Your support for this *\$800,000 USDA CSREES Special Grant to support essential barley research in Minnesota, North Dakota, Oregon, Washington, and Wisconsin* is deeply appreciated.

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