POSITION DESCRIPTION - ASSISTANT PROJECT SCIENTIST

Title: Assistant Project Scientist

Location: Plant Sciences
University of California
Davis, California

NATURE AND PURPOSE
The Project Scientist makes significant and creative contributions to a research or creative project in his/her academic discipline. The appointee possesses the subject matter expertise and the creative energy necessary to function at a high level of competence. The appointee will participate in activities to increase, improve, or upgrade competency. Appointees with Project (e.g., Scientist) titles may engage in University and public service. They do not have teaching responsibilities. Although the Project Scientist is expected to work independently under the general guidance of an academic member with an independent research program (i.e., Professor, Professional Researcher, Specialist in Cooperative Extension, etc), he/she is not required to develop an independent research program or reputation. He/she will carry out research or creative programs with supervision by an individual in an academic title that carries with it automatic Principal Investigator status. The Project Scientist does not usually serve as a Principal Investigator but may do so by exception.

BACKGROUND OF THE POSITION
Small grains in California provide valuable rotations in more than a million acres (wheat 750,000 ac, barley 100,000 ac and oats 250,000 ac). The selected small grains breeder is expected to dedicate ~40% of his/her time to barley, ~40% to wheat and ~20% to oat breeding. The selected candidate is expected to collaborate with current breeders and gradually take additional responsibilities in leading the barley and oats breeding programs. In addition, the selected candidate is expected to interact with growers and industry, develop commercial varieties, and engage in applied research relevant to small grain production in California. The selected candidate is expected to assist in seeking funding and in writing grant proposals. Funding for the position is supported by the California Wheat Commission and by the Triticeae-CAP project funded by USDA-AFRI (http://triticeaecap.org/).

MAJOR RESPONSIBILITIES

I. BREEDING (70%)

The main objective of this position is the breeding of new commercial varieties of barley, wheat and oats. The selected candidate is expected to generate crosses every year to incorporate new traits and new sources of variability. The F$_1$ hybrids will be planted in Tulelake to generate F$_2$ seed, which will advanced in subsequent years until homozygocity. Fixed lines will be tested first in un-replicated observation trials. The appointee will then select the best lines based on yield, disease resistance and quality and advance the best lines to replicated preliminary yield trials. Additional cycles of selection will be performed in Advanced yield trials at UC Davis and in Elite yield trials at multiple locations. The appointee will select, in collaboration with the PI and colleagues in the breeding team, the
best lines to be tested in the Small Grains Regional Testing program. The appointee will produce Breeder Seeds from the selected lines and coordinate with the Foundation Seed Program for the increases of Foundation Seed. The appointee will prepare all the documentation required for germplasm releases and PVP.

For wheat, the selected candidate will collaborate with the senior wheat breeder to develop wheat lines with improved tolerance to abiotic stresses, including durum wheat varieties with increased tolerance to salt stress (e.g. incorporation of Nax1 and Nax2 genes) and common wheat varieties with increased drought tolerance.

For barley, the appointee will lead the development of malting varieties resistant to stripe rust and BYDV and CYDV viruses. The selected candidate will develop molecular markers for CYDV and use available markers for BYDV, stripe rust and malting quality traits to accelerate the selection of lines combining all the necessary beneficial alleles.

For oats, the selected candidate will create new varieties with similar flowering earliness as ‘Monetuzma,’ a very old California variety which is susceptible to most foliar diseases. In addition the appointee will develop strategies to increase the resistance of oat varieties to ‘Red Leaf’ disease, which is caused by the viruses of the Barley Yellow Dwarf (BYD)/Cereal Yellow Dwarf (CYDV) complex – the same set of viruses that afflict barley and bread wheat.

II. RESEARCH (20%)

Research activity (10%)
Although the main objective of this position is the breeding of new varieties of small grains, the appointee is encouraged to conduct research in areas directly related to small grain improvement (and to look for funding to support such research). Research areas include, but are not limited to, mapping new resistance and quality genes, developing new molecular markers for useful traits, establishing novel breeding strategies, etc. The candidate will help to determine research goals in consultation with the Principal Investigator.

The appointee will evaluate germplasm collections, Association Mapping panels and Nested Association Mapping populations for stripe rust and other diseases. The appointee will use these phenotypic data and available genotypic data to perform association mapping and identify chromosome regions associated with the resistance genes. He/she will then introgress the selected chromosome segments into the breeding lines.

Grant Acquisition (10 %)
The selected candidate will be responsible for preparing annual reports of his/her breeding activities for the different grants and industry groups that support the breeding program. The appointee will actively look for funding of the breeding program from growers, industry, state and granting agencies. In addition, the selected candidate will assist the PI in writing new grant proposals to extend and/or expand this project and, when appropriate will participate as CoPI).

Publication (5%)
The selected candidate will take the responsibility to collect data, annotate results and write reports of the annual breeding activities. The appointee will be also responsible to prepare the
documentation required for the PVP releases of his/her varieties and is encouraged to publish those germplasm releases in the Journal of Plant Registration. The selected candidate is also expected to contribute to publications in peer-reviewed breeding journals in collaboration with the Principal Investigator (PI) and/or other members of the research team.

III. PROFESSIONAL COMPETENCE AND ACTIVITY (5%)

The selected candidate will participate in professional societies and attend conferences appropriate to his/her specific field. The selected candidate will contribute to presentations at seminars, laboratory meetings and invited lectures. The selected candidate will also present his breeding and research results and give oral presentations to public and professional interest groups.

IV. UNIVERSITY AND PUBLIC SERVICE (5%)

The selected candidate will engage in public outreach activities that include presenting breeding lines and research results to small grains growers and industry during field days. He/she will respond to questions from the growers regarding the small grain varieties produced by his/her program and make presentations in small grains grower and end users meetings.

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Supervisor's Signature

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Employee's Signature

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Date