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To Whom it May Concern

Plant Breeding is a fascinating career that requires knowledge of many aspects of plant variety development. One has to understand disciplines from the molecular biology of biochemistry, molecular genetics to population development of quantitative genetics, plant physiology, optimizing selection decisions, field experimental design, population sizes, plant diseases, agronomy to large scale systems thinking of pilot scale testing, logistical management and consumer preference. Having an understanding of all these disciplines is essential when making plant breeding decisions and is what I find exciting and motivating to be a plant breeder. Furthermore, with the increasing complexity of plant breeding, one cannot make such decisions alone, and I am passionate and excited to work on a team of many experts to ensure that we are successful in the goals of the variety selection and improvement. My experience with developing both a novel winter malting barley breeding program and starting an organic naked barley characterization project in collaboration with multiple research institutions has given me invaluable experience across many aspects of the plant breeding pipeline. I am currently a PhD candidate in Plant Breeding and Genetics at Cornell University under the advisement of Dr. Mark Sorrells and will be graduating in May 2023.

From the beginning of my PhD, I have been involved in two barley breeding projects. The first was a collaborative research project characterizing and breeding organic naked multi use barley across the United States. I have been highly involved and lead projects involving genome wide association studies for disease resistance and threshability, evaluation of winter and spring variety trials for agronomic and quality traits, genetic by environment analysis of winter barley across the Northern United States and using aerial imaging to quantify barley growth rate as a potential component of weed competitive ability in an organic environment. I also started a small scale population of crossing winter naked barley lines to elite covered barley lines. The second project I have been involved in has been developing a winter malting barley breeding program. We have developed two populations consisting of double haploidization and traditional recombinant inbred lines. Agronomic traits we prioritize in our breeding program include yield, heading date, foliar and grain disease resistance, maturity and winter survival. Quality traits we examine include balancing between selection against pre-harvest sprouting but also selection against seed dormancy after a number of days and months after the physiological maturity of the grain. We have also conducted small scale malting quality analysis of beta glucan, alpha amylase, diastatic power, beta glucan and combustion analysis of nitrogen. Balancing all of these traits for selection decisions requires a balancing act to weigh the value of each of these traits using selection indices, truncation selection and potentially optimal contribution.

Given the challenges of breeding hot peppers, particularly for traits such as capsaicin content that require knowledge in both biochemistry pathways and genetic by environmental effects, I believe that I would be very well suited for this position given my breadth of experiences in different aspects of plant genetics, breeding and selection.

Sincerely,

A handwritten signature in black ink, appearing to read 'Karl Hans Kunze', written in a cursive style.

Karl Hans Kunze