

# Kentucky Wheat Breeding Lines: Identifying Their Aroma, Flavor and Dough Functionality to Serve Local Artisan Bakeries

Maria Paula Castellari and David Van Sanford

University of Kentucky, Department of Plant and Soil Science, Lexington KY, 40546

## Introduction

- SRW wheat grown in Kentucky is mostly sold to millers as an agricultural commodity.
- There is a growing interest in identifying value added markets for KY wheat, such as artisan-baked goods.
- Wheat flavor parameters have become important as criteria in consumer selection because locally grown cereal quality have received increased attention, but there is an expressed concern that modern wheat selection programs have narrowed the genetic basis of newer wheat varieties to propagation of successful varieties that are genetically related.
- To know if we can breed wheat for these markets, we must: 1) assess the variation in wheat varietal flavor and aroma profiles; 2) determine the heritability of these traits.

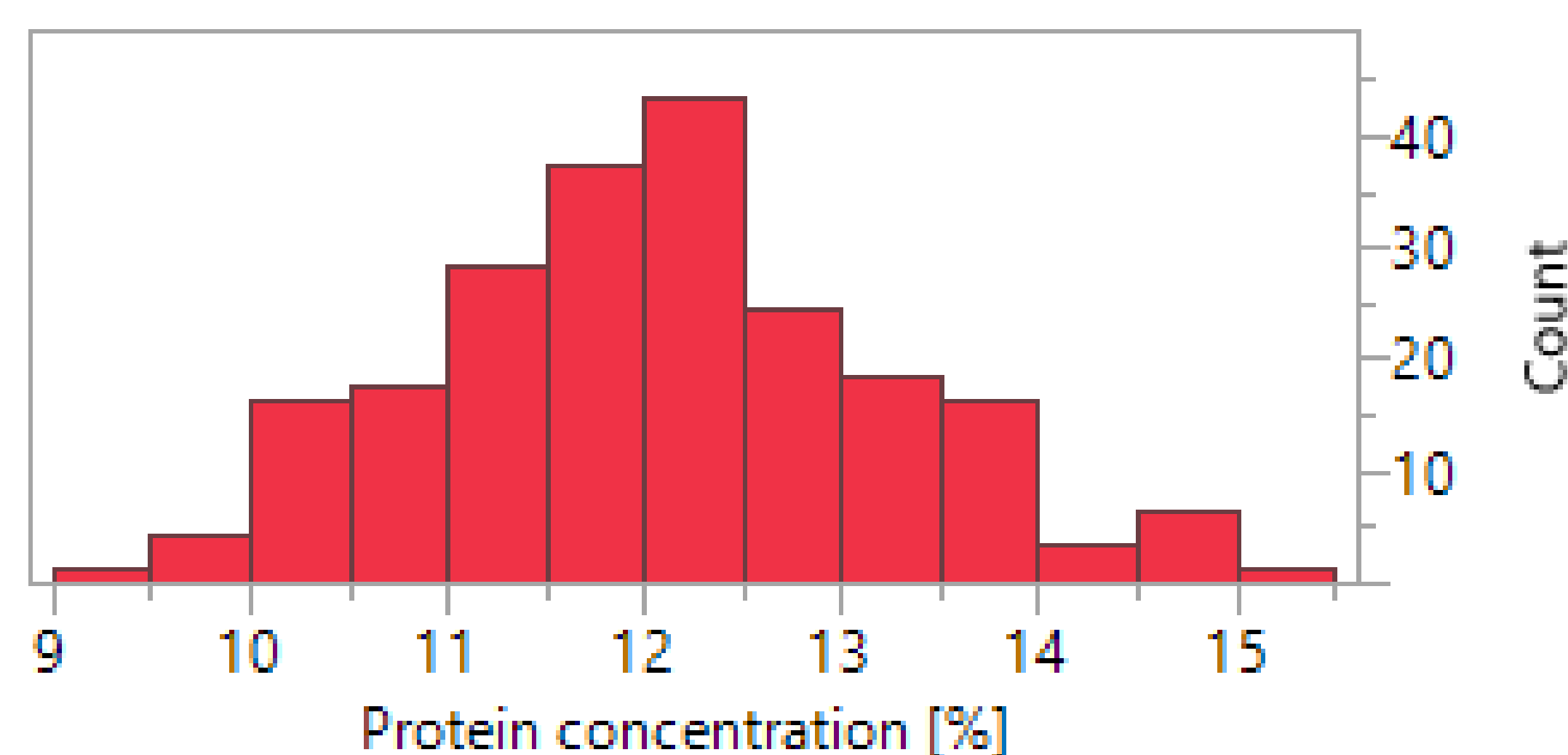
## Materials and Methods

- 150 SRW wheat lines from the UK wheat breeding program will be screened for aroma of a porridge-like preparation using a sensory panel evaluation.
- Aroma and flavor will be assessed in the baked bread from selected lines of the previous screening, also using the sensory panel method.
- Kernel hardness and protein content will be evaluated through NIR spectrometry and gluten strength will be estimated through the Wheat Meal SDS Sedimentation Volume Test and loaf volume.

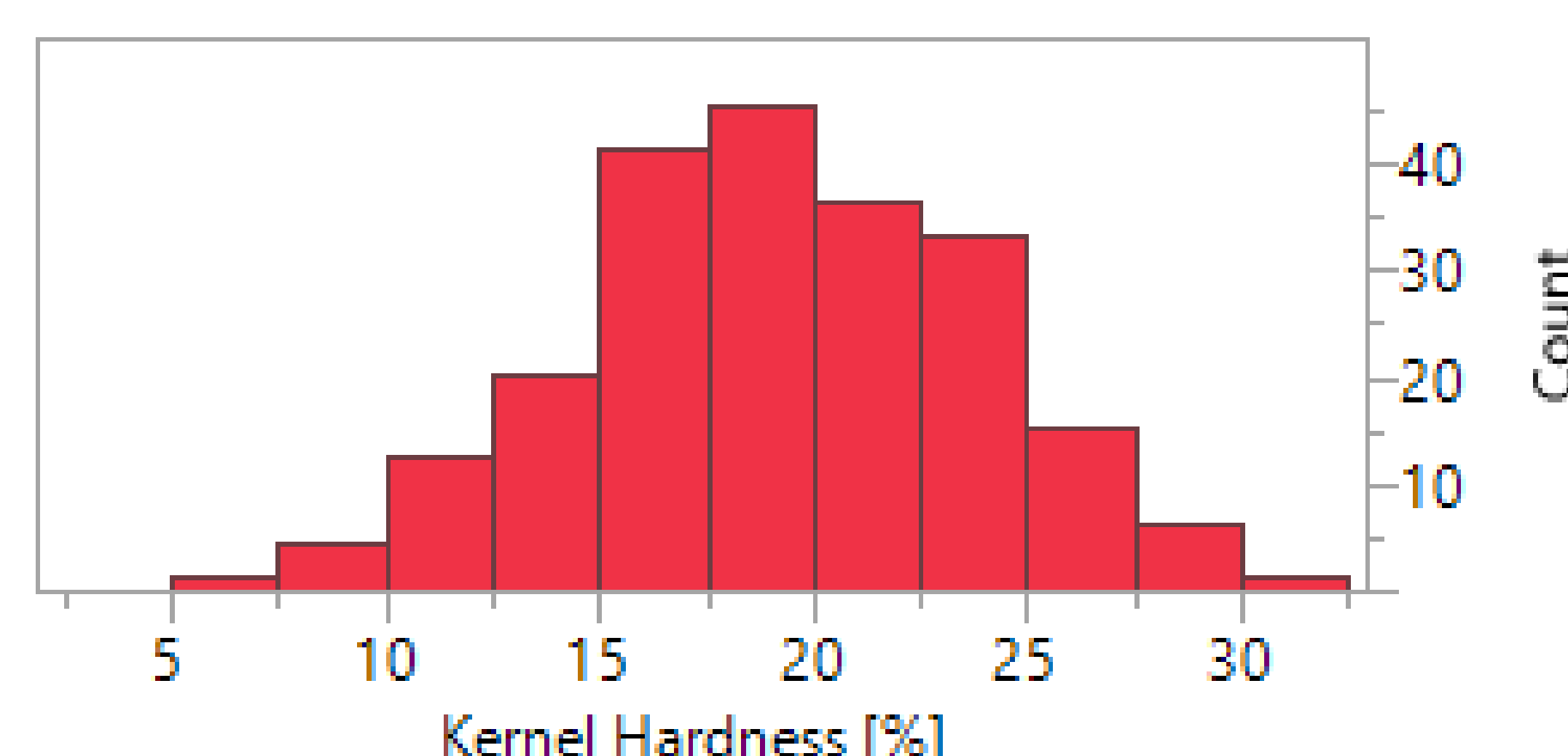


## Preliminary outcomes

- Substantial variability of protein concentration (Graph 1) and kernel hardness (Graph 2) between genotypes content was noticeable from preliminary NIR data, with protein concentration ranging from 9 to 15%, and Kernel hardness from 5% to 30%. This could be a good indicator of the variability between samples due to genotypes:



Graph 1: Histogram of Protein concentration (%) from NIR analysis



Graph 2: Histogram of Kernel hardness (%) from NIR analysis

- “Overall aroma” descriptor from the aroma evaluation of a porridge-like preparation from 123 wheat lines showed a significant difference due to genotype (Table 1):

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
NAME ID	122	390.8283	3.20351	1.5252	0.0007*
Error	659	1384.1602	2.10039		
C. Total	781	1774.9885			

Table 1: Analysis of variance of “Overall Aroma” descriptor from the sensory evaluation of the porridge-like preparation.

## Next Steps

- Bread sensory evaluations and sedimentation test for gluten strength determination will be performed during Spring semester of 2021
- The ultimate measure of success will be identifying breeding lines that have desirable flavor, aroma, and dough properties in combination with superior agronomic traits and the capacity to be grown in Kentucky and sold to local artisan millers and bakers.