

## OK168512 (Breakthrough)

- **Proven resistance to wheat streak mosaic and Triticum mosaic.** No other OSU cultivar carries *Wsm1* from intermediate wheatgrass, or any known *Wsm* gene. *Wsm1* is a proven source of protection against these mite-transmitted viral diseases, first commercialized in Oklahoma in the cultivar Mace following its development and release by USDA-ARS (Lincoln, NE). No HRW or HW cultivar currently grown in the southern High Plains is known to carry *Wsm1*. Linkage drag for yield and quality traits can be the Achilles heel of *Wsm1* deployment, but that is not the case with OK168512.

- **Yield and test weight competitiveness to complement virus resistance.** OK168512 placed in the top yield group for the 2-yr mean (2019, 2020) at three of four panhandle sites in the OSU wheat variety trials. Its relative yield performance in the panhandle was much better in 2019 than in the 2020 variety trials (about average for a given nursery). Interestingly, OK168512 performed well in statewide breeder trials in 2020, placing in the top yield group in the OET3 at Lahoma, Kingfisher, Ardmore, and Okmulgee. While OK168512 is adapted statewide, its disease resistance pattern is most fitting for NW OK. Test weight of OK168512 should be considered in excellent company with Iba.

- **A functionality reputation worthy of cultivars without *Wsm1*.** OK168512 was evaluated in the 2020 Wheat Quality Council evaluation program (2019 crop), where it performed above-average for overall baking quality among all entries submitted by breeding programs throughout the Great Plains. It has also undergone evaluation by industry collaborators and has been noted for very good mix strength but slightly low water absorption.

- **Realistic alternative to displacement of TAM 112 in the Oklahoma panhandle.** TAM 112 is the overwhelming cultivar of choice for wheat producers in the Oklahoma panhandle faced with the threat of mite-transmitted viruses. OK168512 offers the same or better level of disease protection at a higher yield level and with improved straw strength, though head-to-head comparisons have not been available to thoroughly test the latter.

- Relative to other candidates considered herein, OK168512 responds poorly to most leaf spotting diseases, particularly *Septoria tritici* blotch and physiological leaf spot, as observed in field nurseries in 2019 and 2020. These diseases are not common in the Oklahoma panhandle.

- OK168512 exhibits a conservative vegetative growth pattern soon after emergence (relatively low early vigor). This can be offset by an increased seeding rate to generate the desired forage production for grazing.

- Nitrogen fertilization recommendations should be followed to meet a 12% wheat protein target, and thus to ensure adequate water absorption for bread production.

- Small kernel size of OK168512 must be considered when calculating optimal seeding rates. Kernel size is expected to decrease when seed production occurs outside of the targeted production area.

· *Recommended positioning* – dual-purpose and grain-only production systems in northwest Oklahoma, extending into southern High Plains environments in Kansas, Colorado, and Texas.

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*Overlay+Wsm1/Fuller//CO050270/3/CO050337-2*

