CORN (Zea mays L.) AND WHEAT (Triticum aestivum) KERNELS STRESS
STRAIN PROPERTIES

Ljiljana Babić, Mirko Babić, Milivoj Radojčin, Ivan Pavkov, Miodrag Zoranović.
Faculty of Agriculture, Department of Agricultural Engineering, University of Novi
Sad, Serbia

The yield point value of force in stress-strain uniaxial compression tests confirmed the
differences in this property between the hard and the soft varieties. The force value for the hard
wheat was almost 2.2 times higher than for soft wheat. High values of secant modulus of
elasticity are recorded within two hard wheat Simonida (244.4 N/mm) and Dragana (241.5
N/mm) varieties in the kernel moisture content scope form 7% to 13% w.b. The modulus has
decreasing tendency with Simonida and Dragana cultivars as the moisture content increase,
while soft variety NS 40S hasn’t such a behavior. The lowest value of secant modulus of
elasticity (106.8 N/mm) for NS 40S was observed at low kernel moisture content (14.1% w.b).
The increasing tendency of these physical properties was recorded as moisture content increase.
The test data of yield point forces and secant modulus of elasticity for six corn hybrids
confirm the differences between semi-flint and dent types. Semi flint types like NS 640
and ZP 434 hybrids demonstrate yield point forces of 307.3 N (12.1% w.b. moisture
content) and 453.6 N (12.9% moisture) respectively; while dent type NS 6010 has 159.3
N (14.8% moisture). The decreasing trend of secant modulus of elasticity was observed
for all tested hybrids as the kernel moisture content increasing. The data statistically
confirm with a high coefficient of regression that there is a linear relationship between the
secant modulus of elasticity and kernel moisture content for all hybrids.