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**Effect of loading speed and axes on the mechanical
properties of safflower seeds**

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Abstract: In this study, the mechanical properties (rupture force, deformation, rupture energy, and force required for rupture) of seeds belonging to two different aspir varieties (Shifa and Remzibey-05) were determined based on different moisture contents, loading axes, and loading speeds. In the experiments, three different moisture levels, three loading axes, and three loading speeds were used. When the results of the mechanical tests were examined in general, it was observed that the load axis and loading speed affected the seeds at different moisture contents. In the Shifa and Remzibey-05 varieties, the effect of the load axis averages on the rupture force, deformation, rupture energy, and force required for rupture was found to be significant at the $p < 0.01$ level. The highest rupture force among the varieties was obtained in the Shifa variety at 54.10 N with 6.36% moisture content on the y-axis and a loading speed of 30 mm min⁻¹, while the lowest rupture force was obtained in the Remzibey-05 variety at 24.83 N with a moisture content of 6.08% on the x-axis at a loading speed of 30 mm min⁻¹. The results obtained for mechanical properties are considered to be important engineering data that can be used in the design, production, development, and operation of machines and systems to be used in post-harvest processing technologies.

Keywords: Safflower, moisture content rupture force, rupture energy