

Turkish Journal of Agriculture and Forestry

Turkish Journal

of

Agriculture and Forestry

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Apple Grading Using Fuzzy Logic

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Abstract: Classification is vital for the evaluation of agricultural produce. However, the high costs, subjectivity, tediousness and inconsistency associated with manual sorting have been forcing the post harvest industry to apply automation in sorting operations. Fuzzy logic (FL) was applied as a decision making support to grade apples in this study. Quality features such as the color, size and defects of apples were measured through different equipment. The same set of apples was graded by both a human expert and a FL system designed for this purpose. Grading results obtained from FL showed 89% general agreement with the results from the human expert, providing good flexibility in reflecting the expert's expectations and grading standards into the results. This application of apple grading can be fully automated by measuring the required features by means of high-tech sensors or machine vision and making the grading decision using FL.

Key Words: Fuzzy logic, fuzzy membership, apple classification, apple grading

Turk. J. Agric. For., **27**, (2003), 375-382.

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