

Dr. Hassan Sadrnia Ferdowsi University of Mashhad November 24, 2009

Dear Dr. Hassan Sadrnia,

We would like to invite you to participate with a presentation at the 6th International Postharvest Symposium, which will be held from April 8 to 12, 2009 in Antalya, Turkey.

The Scientific Committee of the symposium is very pleased to inform you that your abstract has been accepted for presentation at the symposium. Your full abstract details are provided in the appendix A for your review and the status of your abstract is as follows:

Abstract Number: PTC/OPAbstract Title: Effect of Variety and Size on the Mechanical Damage of WatermelonPresentation Type: Poster Presentation

Thank you again for your submission and we hope to see as many of our extended postharvest family as possible at the symposium.

We are looking forward to seeing you at Antalya, Turkey.

Sincerely,

Prof. Mustafa ERKAN, Convener

Department of Horticulture Faculty of Agriculture Akdeniz University 07059 Antalya, Turkey Phone: +90 242 3102428 Fax : +90 242 2274564 E-mail : erkan@akdeniz.edu.tr

www.postharvest2009.com

ABSTRACT DETAILS

Abstract Number : PTC/OP 146-PS Presentation Type : Poster Presentation Presentation Date & Time :

Abstract Title

Effect of Variety and Size on the Mechanical Damage of Watermelon

Scientific Topic

Handling of organic produce

Abstract

A large percentage of fruits and vegetables are wasted each year due to mechanical damage during journey from field to consumption. Therefore, It is requires to protect fruits from the loads that cause bruise or failure. This research performed to determine and compare mechanical behavior of different varieties and sizes of watermelon on static load condition in order to obtain parameters used in harvest, handling, transportation and storage. A statistical factorial experiments in the form of completely randomize design $(2 \times 3 \times 2)$ with five replication was used to determine mechanical behavior of entire watermelon such as failure force, failure deformation and rind thickness. The results were analyzed by SPSS V.9 software. It is found that failure force is affected by direction compression. Failure force at longitudinal direction is less than transverse direction while variation size is not significantly affected failure force and failure deformation. Also results showed failure force and failure deformation are significantly affected by variety. Mean failure force in Charleston Gray and Crimson sweet are respectively 1.1 KN and 1.8 KN. Investigation rind thickness in different varieties and sizes of watermelon size is not significantly affected by oriety.

Authors

Hassan Sadrnia^{1,2}, Ali Rajabipour², Ali Jafari², Arzhang Javadi³, Younes Mostofi²

¹Ferdowsi University of Mashhad, Mashhad, 91779-48978, Iran

²University of Tehran, Karaj, P.O. Box: 4111, Iran.

³Agriculture Engineering Research Institute, Karaj, 31585-854, Iran.

th INTERNATIONAL POSTHARVES

ABSTRACTS BOOK

TÜBİTAK

ISHS

08 - 12 APRIL 2009 ANTALYA

nrtey



6th INTERNATIONAL POSTHARVEST SYMPOSIUM 08 - 12 APRIL 2009 ANTALYA / TURKEY



A

P23-PTC/OP 145-PS

Finite Element Analysis of Mechanical Damage in Watermelon

Hassan Sadrnia^{1,2}, Ali Rajabipour², Ali Jafari², Arzhang Javadi³ and Younes Mostofi²

Ferdowsi University of Mashhad, Mashhad, 91779-48978, Iran.

²University of Tehran, Karaj, P.O. Box:4111, Iran.

³Agriculture Engineering Research Institute, Karaj, 31585-854, Iran.

Measuring internal stresses that cause bruise inside of fruit is extremely difficult. An alternative approach is to estimate the stresses using finite element analysis (FEA). In this research, tow finite element models of watermelon were developed to investigate mechanical pressure. The pressure was simulated at tow orientations of the fruit: longitudinal and transversal; for thickness of the rind from 0.6 mm to 1.8 mm. The validations of the FEA models were made based on a comparison of theoretical calculations and experimental data. FEA results indicated that the internal fleshes of watermelons were the main structural sites prone to fail mechanically after pressure. The simulated patterns of failure closely agree with those observed after subjecting fruits to compressive loading. Based on FEA, it is necessary that the magnitude of load on watermelon was maintained below 10 pre cent of force that caused its rind cracking.

P24-PTC/OP 146-PS

Effect of Variety and Size on the Mechanical Damage of Watermelon

Hassan Sadrnia^{1,2}, Ali Rajabipour², Ali Jafari², Arzhang Javadi³ and Younes Mostofi²

Ferdowsi University of Mashhad, Mashhad, 91779-48978, Iran.

²University of Tehran, Karaj, P.O. Box: 4111, Iran.

³Agriculture Engineering Research Institute, Karaj, 31585-854, Iran.

A large percentage of fruits and vegetables are wasted each year due to mechanical damage during journey from field to consumption. Therefore, It is requires to protect fruits from the loads that cause bruise or failure. This research performed to determine and compare mechanical behavior of different varieties and sizes of watermelon on static load condition in order to obtain parameters used in harvest, handling, transportation and storage. A statistical factorial experiments in the form of completely randomize design $(2 \times 3 \times 2)$ with five replication was used to determine mechanical behavior of entire watermelon such as failure force, failure deformation and rind thickness. The results were analyzed by SPSS V.9 software. It is found that failure force is affected by direction compression. Failure force at longitudinal direction is less than transverse direction while variation size is not significantly affected failure force and failure force in Charleston Gray and Crimson sweet are respectively 1.1 KN and 1.8 KN. Investigation rind thickness in different varieties and sizes of watermelon showed that five millimeter increasing in rind thickness can increase failure force up to 70%.