ABSTRACT ACCEPTANCE LETTER

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.

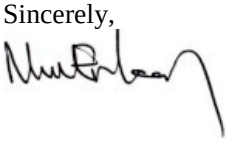
The Scientific Committee of the symposium is very pleased to inform you that your abstract has been accepted for presentation at the symposium. Your full abstract details are provided in the appendix A for your review and the status of your abstract is as follows:

Abstract Number	:	*PTC/OP*
Abstract Title	:	*Finite Element Analysis of Mechanical Damage in Watermelon*
Presentation 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

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ABSTRACT DETAILS

Abstract Number : PTC/OP 145-PS

Presentation Type : Poster Presentation

Presentation Date & Time :

Abstract Title

Finite Element Analysis of Mechanical Damage in Watermelon

Scientific Topic

Handling of organic produce

Abstract

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.

Authors

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6th INTERNATIONAL POSTHARVEST SYMPOSIUM

ABSTRACTS BOOK

TÜBİTAK

ISHS

08 - 12 APRIL 2009

ANTALYA

Turkey

Younes Mostafi

6th INTERNATIONAL POSTHARVEST SYMPOSIUM

08 - 12 APRIL 2009

ANTALYA / TURKEY

P23-PTC/OP 145-PS

Finite Element Analysis of Mechanical Damage in Watermelon

Hassan Sadrnia [1,2], Ali Rajabipour [2], Ali Jafari [2], Arzhang Javadi [3] and Younes Mostofi[2]

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P24-PTC/OP 146-PS

Effect of Variety and Size on the Mechanical Damage of Watermelon

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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× 3×2) 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 showed that five millimeter increasing in rind thickness can increase failure force up to 70%.