1. Effects of temperature, pH and O2 on the removal of hydrogen sulfide from biogas by external biological desulfurization in a full scale fixed-bed trickling bioreactor (FBTB)

Accession number: 20131816246655
Authors: Naegele, Hans-Joachim (3); Lindner, Jonas (1); Merkle, Wolfgang (1); Lemmer, Andreas (1); Jungbluth, Thomas (1); Bogenrieder, Claus (2)
Author affiliation: (1) University of Hohenheim, State Institute for Agricultural Engineering and Bioenergy, Garbenstrae 9 Stuttgart, Baden-Wuerttemberg, DE 70599, Germany; (2) Zueblin Umwelttechnik GmbH, Umwelttechnik, Otto-Duerr-Strae, 1 Stuttgart, Baden-Württemberg, DE 70599, Germany; (3) State Institute for Agricultural Engineering and Bioenergy (740), University of Hohenheim, Germany
Corresponding author: Naegele, H.-J.(hajo.naegele@uni-hohenheim.de)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 1
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Hydrogen sulfide (H 2S) is a critical component of biogas formed under anaerobic conditions by sulfur and sulfate reducing bacteria from animal manure and renewable energy crops. H2 S causes high corrosion in equipment, has a negative environmental impact, inhibits the biogas formation process and is furthermore odorous and toxic. Although several methods for internal and external desulfurization found their way into practice and had been explored at laboratory scale, no data were available on the performance of such methods in full scale practice, especially for an external fixed-bed trickling bioreactor (FBTB). The effects of temperature, pH and air ratio on H 2S removal efficiency (RE) were studied. The study was conducted at a research biogas plant with a given output of 96 m3biogas per hour, and an H 2S concentration ranging between 500 ppm and 600 ppm (1 ppm=1 cm3/m3) on average. The FBTB column has been designed to hold a packing volume of 2.21 m3 at a gas retention time of 84 seconds being loaded at an average of 32.88 g H2S/(m3·h). The highest H2S RE of 98% was found at temperatures between 30°C and 40°C. A major decline in RE to 21%-45% was observed at temperatures from 5°C to 25°C. The results clearly showed a temperature optimum range for sulfate reducing bacteria. The results reveal that RE is little affected by different pH values and air ratios. During the experimental period, the practical suitability of the FBTB system could be proved while avoiding the disadvantages of internal biological desulfurization methods.
Number of references: 30
Main heading: Desulfurization
Controlled terms: Agriculture - Bacteria - Bioconversion - Biogas - Biological water treatment - Bioreactors - Environmental impact - Hydrogen - Hydrogen sulfide - Manures - Sulfur determination - Temperature
Uncontrolled terms: Anaerobic conditions - Biological desulfurization - Effects of temperature - Fixed-bed - Removal efficiencies - Sulfate reducing bacteria - Sulfur- and sulfate reducing bacteria - Temperature optimums
Classification code: 821.5 Agricultural Wastes - 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 804.2 Inorganic Compounds - 804 Chemical Products Generally - 802.2 Chemical Reactions - 802.1 Chemical Plants and Equipment - 801.2 Biochemistry - 801 Chemistry - 641.1 Thermodynamics - 522 Gas Fuels - 454.2 Environmental Impact and Protection
DOI: 10.3965/j.ijabe.20130601.007
Database: Compendex

Data Provider: Engineering Village

2. CFD Simulation of fixed bed dryer by using porous media concepts: Unpeeled longan case

Accession number: 20131816246658
Authors: Prukwarun, Wuttichai (1); Khumchoo, Wasan (1); Seancotr, Waraporn (1); Phupaichitkun, Sarawut (1)
Author affiliation: (1) Department of Material Science and Engineering, Silpakorn University, Nakorn Pathom, 73000, Thailand
Corresponding author: Phupaichitkun, S.(sarawut_phupaichitkun@yahoo.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.

Volume: 6
Issue: 1
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Quality of dried product depends on the temperature and velocity at each position in the dryer. Simultaneous microscopic and macroscopic simulation on Computational Fluid Dynamic (CFD) is a general problem of fixed bed dryer consisting of water transportation in porous media and dynamic flow of hot air in the dryer. Simplifying the dryer by assuming the packed bed as porous volume, viscous and inertial resistances ($1/\alpha$ and C2) are necessary for calculating the pressure drop and velocity change in the bulk. Comparing the {increment}P/L of the standard packing with experimental results, the porosity and resistance parameters can be estimated. Simulation of unmodified, adding false floor and invest mesh, and insulating the dryer wall are used for validation with previous results. Adding the round holed sieve as false floor and invert mesh can produce better profile but cannot obtain uniform distribution. Air velocity distribution shows similar but the calculating temperature is higher than that from the experiment. By analysis of thermal efficiency of dryer without insulator, the heat loss rates with flue gas and heat flux at wall are in the range 14%-17% and 5.5%-7.3%. Integrating with single fruit or thin layer drying kinetic in the future, the CFD simulation can be used for optimal design of fixed bed dryer.
Number of references: 16
Main heading: Computational fluid dynamics
Controlled terms: Dryers (equipment) - Floors - Flue gases - Heat flux - Packed beds - Porous materials - Velocity distribution
Uncontrolled terms: Air velocity distributions - ANSYS - Deep-bed - Longan - Resistance parameters - Thermal efficiency - Uniform distribution - Water transportation
Classification code: 951 Materials Science - 943.2 Mechanical Variables Measurements - 921.6 Numerical Methods - 802.1 Chemical Plants and Equipment - 641.2 Heat Transfer - 521 Fuel Combustion and Flame Research - 402 Buildings and Towers
DOI: 10.3965/j.ijabe.20130601.0010
Database: Compendex

Data Provider: Engineering Village

3. Physical and mechanical properties of some hybrid corn varieties

Accession number: 20131816246659
Authors: Oztürk, Turgut (1); Esen, Bilge (1)
Author affiliation: (1) Department of Agricultural Structure and Irrigation, University of Ondokuz Mayis, 55139 Samsun, Turkey
Corresponding author: O ztürk, T.(turgutoz@omu.edu.tr)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 1
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The aim of this study was to determine the structural designing parameters of silo and bins used for storage of some hybrid corn varieties (Zea mays L.). In the research, three corn varieties-dentcorn (Zea mays indentata Sturt.), popcorn (Zea mays everta Sturt.), sweetcorn (Zea mays sacharata Sturt.)-widespread cultivated in Turkey were used. Physico-mechanical parameters (bulk density, true density, angle of internal friction, static coefficient of friction) were considered as the dependent variables, and moisture content (8%, 10%, 12%, 14%) as the independent variable. The bulk density, true density and angle of internal friction varied from 608.46 to 856.46 kg/m3, 950.88 to 1110.89 kg/m3, 25.2°to 34.2°, respectively, with the increase in moisture content from 8% to 14%. According to results of the research, the highest average value for bulk density, true density, angle of internal friction were found in popcorn variety (839.17

kg/m3), popcorn variety (1 074.40 kg/m3), sweetcorn variety (30.50°), respectively. The highest average value for static coefficient of friction at concrete surface (C30) was recorded in dentcorn variety (0.662).
Number of references: 32
Main heading: Internal friction
Controlled terms: Moisture determination - Physical properties
Uncontrolled terms: Angle of internal friction - Coefficient of frictions - Concrete surface - Corn varieties - Dependent variables - Independent variables - Physical and mechanical properties - Static coefficient of frictions
Classification code: 931.2 Physical Properties of Gases, Liquids and Solids - 944.2 Moisture Measurements
DOI: 10.3965/j.ijabe.20130601.0011
Database: Compendex

Data Provider: Engineering Village

4. Mechanization technology: The key to sugarcane production in China

Accession number: 20131816246649
Authors: Yinggang, Ou (1); Wegener, Malcolm (2); Dantong, Yang (1); Qingting, Liu (1); Dingke, Zheng (1); Meimei, Wang (1); Haochun, Liu (1)
Author affiliation: (1) College of Engineering, South China Agricultural University, Guangzhou 510642, China; (2) School of Agriculture and Food Sciences, University of Queensland, Brisbane, QLD4072, Australia
Corresponding author: Yinggang, O.(ouying@scau.edu.cn)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 1
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Sugarcane is an important cash crop in southern China now planted on about 1.5 million ha in the main production areas in Guangxi, Zhuang Autonomous Region and Yunnan, Guangdong, and Hainan Provinces. Since the cost of labor in China is increasing rapidly and the price of local sugar is uncompetitive with mechanized international producers, China needs to change its sugarcane production methods from manual work to mechanization in order to catch up with international trends in this global industry. Although a lot of efforts in China have gone into sugarcane mechanization since the 1960s, the overall level of mechanization in sugarcane production is still only approximately 30%, which is about 20% lower than that achieved in the other main field crops. Almost all of the sugarcane grown in China is still harvested by hand. In order to summarize past experience and promote the mechanization of sugarcane production in China, this paper reviews the whole process of developing mechanization since 1960s and describes the current state of sugarcane mechanization in China. The researches currently being undertaken and the main obstacles to be overcome in developing a mechanized sugarcane production system are described. The design and test of sugarcane harvesting machinery and its key components have been a significant research area by some Chinese universities, research institutes, and manufacturing companies in these past decades. This paper reviews that research and outlines the main achievements which have been made in this area. Mechanized harvesting systems for sugarcane and the appropriate harvesting patterns suitable for different growing conditions applying in China have also been studied. The paper concludes with some comments on the future directions for progress in China's mechanization of sugarcane production and some policy suggestions to facilitate the industry's transition.
Number of references: 193
Main heading: Mechanization
Controlled terms: Crops - Industrial research - Machinery - Sugar industry
Uncontrolled terms: Chinese universities - Development patterns - Harvesting patterns - Manufacturing companies - Mechanized harvesting - Research institutes - Sugarcane harvesters - Sugarcane production system
Classification code: 601 Mechanical Design - 821.4 Agricultural Products - 822 Food Technology - 901.3 Engineering Research
DOI: 10.3965/j.ijabe.20130601.001
Database: Compendex

Data Provider: Engineering Village

5. Warm congratulations on IJABE's inclusion in Ei Compendex

Accession number: 20133916790608
Authors: Yingkuan, Wang
Corresponding author: Yingkuan, W.
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 103
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: IJABE has recently been included for abstracting and indexing in Ei Compendex after strict peer review and evaluation by the Compendex Scope and Coverage Committee. Warm congratulations on IJABE's coverage in Ei Compendex!.
Database: Compendex

Data Provider: Engineering Village

6. IJABE is a fast-growing peer-reviewed OA journal: Updated introduction to IJABE in 2013

Accession number: 20133916790609
Authors: Yingkuan, Wang (1)
Author affiliation: (1) No. 41, Maizidian Street, Chaoyang District, Beijing 100125, China
Corresponding author: Yingkuan, W.(ijabe@sina.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 105-106
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: International Journal of Agricultural and Biological Engineering (IJABE, www.ijabe.org) is a peer reviewed open access international journal. IJABE, started in 2008, is a joint publication co-sponsored by US-based Association of Agricultural, Biological and Food Engineers (AOCABFE) and China-based Chinese Society of Agricultural Engineering (CSAE). The ISSN 1934-6344 and eISSN 1934-6352 numbers for both print and online IJABE have been registered in US. Now, Int. J. Agric. & Biol. Eng (IJABE) is published in both online and print version.
Database: Compendex

Data Provider: Engineering Village

7. Nanoparticles based sensors for rapid detection of foodborne pathogens

Accession number: 20131816246650
Authors: Paul, Chen (1); Li, Yanbin (2); Cui, Tianhong (3); Ruan, Roger (4); Ruan, Roger (1)
Author affiliation: (1) Department of Bioproducts and Biosystems Engineering, University of Minnesota, 1390 Eckles Ave, St. Paul, MN 55108, United States; (2) Department of Biological and Agricultural Engineering, University of Arkansas, 203 Engineering Hall, Fayetteville, AR 72701, United States; (3) Department of Mechanical Engineering, University of Minnesota, 111 Church Street SE, Minneapolis, MN 55455, United States; (4) Department of Food Science and Nutrition, University of Minnesota, 1390 Eckles Ave., St. Paul, MN 55108, United States
Corresponding author: Ruan, R.(ruanx001@umn.edu)

Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 1
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Rapid detection of foodborne pathogens is a key step in the control of food related diseases. Conventional methods for the detection of food pathogens, although typically sensitive, often require multiple time-consuming steps such as extraction, isolation, enrichment, counting, etc., prior to measurement, resulting in testing times which can be days. There is a need to develop rapid and sensitive detection methods. This review is intended to provide food scientists and engineers an overview of current rapid detection methods, a close look at the nanoparticles especially magnetic nanoparticle-antibody conjugates based methods, and identification of knowledge gaps and future research needs.
Number of references: 62
Main heading: Food microbiology
Controlled terms: Disease control - Nanomagnetics - Nanoparticles - Nuclear magnetic resonance
Uncontrolled terms: Conventional methods - Food pathogens - Food-borne pathogens - Magnetic nano-particles - Rapid detection - Research needs - Scientists and engineers - Sensitive detection
Classification code: 461 Bioengineering and Biology - 701.2 Magnetism: Basic Concepts and Phenomena - 708 Electric and Magnetic Materials - 761 Nanotechnology - 932.2 Nuclear Physics - 933 Solid State Physics
DOI: 10.3965/j.ijabe.20130601.002
Database: Compendex

Data Provider: Engineering Village

8. Effects of reaction temperature, time and particle size on switchgrass microwave pyrolysis and reaction kinetics

Accession number: 20131816246653
Authors: Zhou, Rui (1); Lei, Hanwu (2); Julson, James L. (1)
Author affiliation: (1) Department of Agricultural and Biosystems Engineering, South Dakota State University, Brookings, SD 57007, United States; (2) Bioproducts, Sciences and Engineering Laboratory, Department of Biological Systems Engineering, Washington State University, Richland, WA 99352, United States
Corresponding author: Lei, H.
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 1
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: This study investigated microwave pyrolysis of switchgrass with particle sizes from 0.5 mm to 4 mm and determined the effects of reaction temperature and time on the yields of bio-oil, syngas, and bio-char. A prediction model was satisfactorily developed to describe the bio-oil conversion yield as a function of reaction temperature and time. Second-order reaction kinetics was also developed to model the switchgrass pyrolysis. Switchgrass with different particle sizes was found to be similarly pyrolyzed by microwave heating. The research results indicated that thermochemical conversion reactions can take place rapidly in large-sized switchgrass by using microwave pyrolysis. GC-MS analysis indicates that the bio-oil contained a series of important and useful chemical compounds: Phenols, aliphatic hydrocarbons, aromatic hydrocarbons, and furan derivatives. These chemical compounds evolved were related to the pyrolysis conditions.
Number of references: 17

Main heading: Pyrolysis
Controlled terms: Association reactions - Biofuels - Derivatives - Enzyme kinetics - Kinetics - Microwaves - Particle size - Plants (botany) - Reaction kinetics - Synthesis gas
Uncontrolled terms: Bio chars - Bio oil - Microwave pyrolysis - Switchgrass - Syn-gas
Classification code: 931 Classical Physics; Quantum Theory; Relativity - 804 Chemical Products Generally - 802.2 Chemical Reactions - 931.2 Physical Properties of Gases, Liquids and Solids - 711 Electromagnetic Waves - 523 Liquid Fuels - 461.9 Biology - 524 Solid Fuels
DOI: 10.3965/j.ijabe.20130601.005
Database: Compendex

Data Provider: Engineering Village

9. Aerial pollutants on a pig farm in peri-urban Beijing, China

Accession number: 20131816246651
Authors: Huaitalla, Roxana Mendoza (1); Gallmann, Eva (1); Xuejun, Liu (2); Hartung, Eberhard (3)
Author affiliation: (1) Institute of Agricultural Engineering, University of Hohenheim, Stuttgart, 70599, Germany; (2) College of Agricultural Resources and Environmental Sciences, China Agricultural University, Beijing 100094, China; (3) Institute of Agricultural Engineering, Christian-Albrechts-University Kiel, Kiel, 24098, Germany
Corresponding author: Huaitalla, R. M.
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 1
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The study was carried out to evaluate the airborne gases and suspended particulate matter concentrations in the pig barns of a commercial pig farm situated in the peri-urban area of Beijing, China. The measurements followed the natural pig life-stages namely: gestation, farrowing, weaning, and fattening. In order to accomplish these objectives, three different measurement devices were employed: (i) color diffusion tubes, (ii) a portable gas measuring device, and (iii) a dust measuring instrument. Due to the rotation of the devices in the different sampling places, the measurements were performed at different time periods during the months of the summer and winter season in Beijing. The pig farm had a capacity of 15 000 pigs per year and the manurial system was identified as "gan qing fen" or dry cleaning of the manure. The main by-products generated by the farm were irrigation water and small-scale biogas production. High dust concentrations were identified in the pig barns, especially during the feeding and manure cleaning events inside the farrowing and weaning barns with slatted floors. Inhalable dust ranged from 0 mg/m3 to 12.45 mg/m3, while the allowable dust ranged from 0 mg/m3 to 9.62 mg/m3. Ammonia concentration ranged from 0 ppm to 20 ppm (1 ppm = 1 cm3/m3), and the carbon dioxide concentration ranged from 300 ppm to 8 000 ppm. The highest ammonia concentration was recorded in the fattening barn during the summer season, while the highest carbon dioxide concentration was reported in the weaning barn during the summer season. The results of this study were similar to the results of studies performed on pig farms under natural and mechanical ventilation systems. On the other hand, the problems encountered during the gas measurements on the pig farm were directly related to the inadequate housing layout due to the obstruction of windows, fans and air channels for indoor ventilation, and thus the measurement devices faced harsh working conditions. Therefore, it is recommended that the housing system should be improved with repaired windows and curtains especially for the winter season; similarly, the repair of the fans should be attempted in order to improve the ventilation, especially in the gestation barns.
Number of references: 28
Main heading: Mammals
Controlled terms: Air pollution - Ammonia - Carbon dioxide - Dry cleaning - Dust - Farm buildings - Gases - Housing - Irrigation - Manures - Repair - Ventilation - Water supply
Uncontrolled terms: Ammonia concentrations - Barn - Carbon dioxide concentrations - China - Measuring instruments - Mechanical ventilation system - Pig farms - Suspended particulate matters
Classification code: 913.5 Maintenance - 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 804.2 Inorganic Compounds - 802 Chemical Apparatus and Plants; Unit Operations; Unit Processes - 931.2 Physical Properties of Gases, Liquids and Solids - 643.5 Ventilation - 451 Air Pollution - 446.1 Water Supply Systems - 403.1 Urban Planning and Development - 451.1 Air Pollution Sources

DOI: 10.3965/j.ijabe.20130601.003
Database: Compendex

Data Provider: Engineering Village

10. Key laboratory of new materials and facilities for rural renewable energy, ministry of agriculture; Henan agricultural University

Accession number: 20134416905582
Authors: Hu, Jianjun (1)
Author affiliation: (1) No.63, Nongye Road, Zhengzhou, Henan Province, China
Corresponding author: Hu, J.(hu.jianjun@163.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Pages: 1
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Database: Compendex

Data Provider: Engineering Village

11. Microwave drying kinetics and quality characteristics of corn

Accession number: 20131816246657
Authors: Choudhary, Ruplal (1)
Author affiliation: (1) Department of Plant, Soil and Agricultural Systems, MC 4415, Southern Illinois University, Carbondale, IL 62901, United States
Corresponding author: Choudhary, R.(choudhry@siu.edu)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 1
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: In recent years, microwave (MW) drying has gained popularity as an alternative drying method for a wide variety of food and agricultural products because of increasing concerns over product quality and production costs. However, the determination of drying kinetics that accurately describes microwave drying characteristics is crucial for the optimization of operating parameters, performance improvement of the drying system and product quality. The objective of this study was to investigate the drying kinetics and the quality characteristics of corn kernels, especially the effects of different initial moisture contents (18.3%, 26.3%, 34.3% and 42.3% db), MW power levels (70, 175 and 245 W) and exposure time (80 s and 120 s) on the drying kinetics, drying rate and various key quality parameters. The results indicated that the increased drying rate at higher power levels (P3, 245 W) reduced the drying time considerably but increased stress crack index and reduced germination. In addition, it reduced bulk density, true density and thousand grain weight (TGW). The germination rate of corn was the highest at MW power level P1 (70 W), with the lowest drying rate and observed to decrease with increase in initial moisture content. The reduction in exposure time decreased stress crack index and increased germination rate, bulk density and true density. The correlation analysis among drying rate, germination, stress-crack index (SCI), bulk density, true density and TGW showed that increasing drying rate could lead to an increase in SCI and decrease in germination, bulk density and true density.
Number of references: 33

Main heading: Drying
Controlled terms: Agricultural products - Cracks - Cultivation - Kinetics - Microwave heating - Quality control
Uncontrolled terms: Bulk density - Corn - Germination - Microwave drying - Stress-crack - True density
Classification code: 931 Classical Physics; Quantum Theory; Relativity - 913.3 Quality Assurance and Control - 821.4 Agricultural Products - 821.3 Agricultural Methods - 711.1 Electromagnetic Waves in Different Media - 642.1 Process Heating - 421 Strength of Building Materials; Mechanical Properties
DOI: 10.3965/j.ijabe.20130601.009
Database: Compendex

Data Provider: Engineering Village

12. Conversion of soy molasses, soy solubles, and dried soybean carbohydrates into ethanol

Accession number: 20131816246654
Authors: Long, Craig C. (1); Gibbons, William R. (1)
Author affiliation: (1) Biology and Microbiology Department, South Dakota State University, Brookings, SD, 57007, United States
Corresponding author: Long, C. C.(cclong@jacks.sdstate.edu)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 1
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Soy molasses and soy solubles are byproducts of the conventional soy protein concentrate and soy protein isolate manufacturing processes, respectively. Conversion of the carbohydrates in these byproducts into ethanol was examined. Standardized amounts of commercial cellulase enzymes (Novozyme cellulase, β–glucosidase, and pectinase) were added to soy molasses and soy solubles solutions prepared at various solid loading rates (33%, 50%, 60%, 75%, and 80%) to hydrolyze oligosaccharides, followed by fermentation for 96 h using Saccharomyces cerevisiae NRRL Y-2034 and Scheffersomyces stipitis NRRL Y-7124. Ethanol-extracted soybean meal (SBM) carbohydrates were also fermented for 96 h without enzymes. S. cerevisiae and S. stipitis produced about 12.5-45.0 g/L and 6.0-28.0 g/L ethanol, respectively, on molasses and solubles across these solid loading rates. The S. stipitis produced about 6.5-17 g/L ethanol and S. cerevisiae produced about 6.5-22 g/L ethanol on ethanol-extracted carbohydrates.
Number of references: 25
Main heading: Loading
Controlled terms: Byproducts - Carbohydrates - Enzymes - Ethanol - Oilseeds - Oligosaccharides - Proteins - Yeast
Uncontrolled terms: Ethanol production - Manufacturing process - Scheffersomyces stipitis - Solid loading rate - Soy molasses - Soy protein concentrates - Soy protein isolates - Soy solubles
Classification code: 672 Naval Vessels - 801.2 Biochemistry - 804 Chemical Products Generally - 804.1 Organic Compounds - 821.4 Agricultural Products
DOI: 10.3965/j.ijabe.20130601.006
Database: Compendex

Data Provider: Engineering Village

13. Pre-treatment of mscanthus sinensis with bacta-sile to aid anaerobic digestion

Accession number: 20131816246656
Authors: Jegede, Abiodun O (1)
Author affiliation: (1) Centre for Energy Research and Development, Obafemi Awolowo University, Ile-Ife, Osun, Nigeria
Corresponding author: Jegede, A. O.
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6

Issue: 1
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The investigation of the biodegradability and methane potential of bacterial pre-treated miscanthus sinensis was carried out. One percent solution of Bacta-sile: A silage promoter was used to pre-treat miscanthus sinensis at 25°C. The anaerobic digestion experiments were carried out at 25°C and 35°C in batch experiments. The organic loading rates (OLR) varied between 1.25 g and 7 g in different batch reactors. The results showed that the highest methane concentration was 57% from digester 1 while the lowest methane produced was 38% from digester 3. The low methane production from digester 3 was attributed to temperature changes and poor organic loading rate. Bacterial pretreatment aided biodegradation of miscanthus at 25°C. Operating temperature of 25°C had a great effect on digestion experiments resulting to longer required Hydraulic Retention Time (HRT).
Number of references: 11
Main heading: Loading
Controlled terms: Anaerobic digestion - Batch reactors - Biodegradation - Carbon dioxide - Experiments - Low temperature production - Methanation - Methane
Uncontrolled terms: Cyanobacteria - Hydraulic retention time - Methane concentrations - Methane production - Miscanthus sinensis - Operating temperature - Organic loading rates - Temperature changes
Classification code: 802.2 Chemical Reactions - 802.1 Chemical Plants and Equipment - 801.2 Biochemistry - 901.3 Engineering Research - 672 Naval Vessels - 644.2 Refrigerants - 522 Gas Fuels - 644.4 Cryogenics
DOI: 10.3965/j.ijabe.20130601.008
Database: Compendex

Data Provider: Engineering Village

14. Spectral response of spider mite infested cotton: Mite density and miticide rate study

Accession number: 20131816246652
Authors: Lan, Yubin (1); Zhang, Huihui (2); Hoffmann, W.C. (1); Juan, D. (1)
Author affiliation: (1) United States Department of Agriculture, Agricultural Research Service, Areawide Pest Management Research Unit, College Station, TX, United States; (2) United States Department of Agriculture, Agricultural Research Service, Water Management Research Unit, Parlier, CA, United States
Corresponding author: Lan, Y.(yubin.lan@ars.usda.gov)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 1
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Abstract: Two-spotted spider mites are important pests in many agricultural systems. Spider mites (Acari: Tetranychidae) have been found to cause economic damage in corn, cotton, and sorghum. Adult glass vial bioassays indicate that Temprano™ (abamectin) is the most toxic technical miticide for adult two-spotted spider mite. From an aerial application standpoint, additional research is needed to identify aerial application parameters for this miticide. The objective of this study was to investigate spectral response of spider mite-infested cotton plants with different density levels of mites and treated with different rates of miticide. Results showed significantly different spectral signatures of cotton plants infested with different density levels of mites. By treating mite-infested cotton plants with five different Temprano rate treatments (control, one-eighth, one-fourth, one-half, and full rates), spectral reflectance curves were found to be significantly different. Four wavelengths of 550 nm, 560 nm, 680 nm and 740 nm were important for detecting the spectral differences among mite infested cotton plants treated with various rate of Temprano. Normalized Difference Vegetative Index imagery was able to detect different levels of cotton plant damage. Half-rate application of Temprano controlled mite-infested plants as effectively as the full-rate application. These findings may lead to reduced cost and quantity of miticides used to maintain effective crop production and protection.

Number of references: 11
Main heading: Cotton
Controlled terms: Cultivation - Reflection - Vegetation
Uncontrolled terms: Cotton plants - Crop protection - Spectral reflectances - Temprano rate treatments - Vegetative index
Classification code: 711 Electromagnetic Waves - 821 Agricultural Equipment and Methods; Vegetation and Pest Control
DOI: 10.3965/j.ijabe.20130601.004
Database: Compendex

Data Provider: Engineering Village

15. A dynamic remote monitoring system for plant root growth and water consumption

Accession number: 20132616450148
Authors: Han, Wen Ting (1, 2, 3); Ju, Yu Tu (1, 3); Dang, Ge Rong (1, 3); Nie, Jun Feng (3); Wu, Pu Te (2, 3); Ooi, Su Ki (4)
Author affiliation: (1) College of Mechanical and Electronic Engineering, Northwest A and F University, Yangling, Shaanxi 712100, China; (2) Institute of Soil and Water Conservation, Northwest A and F University, Yangling, Shaanxi 712100, China; (3) Institute of Water Saving Agriculture in Arid Regions of China, Northwest A and F University, Yangling, Shaanxi 712100, China; (4) National ICT Australia, Victoria Research Lab., Department of Electrical and Electronic Engineering, The University of Melbourne, Parkville, VIC 3010, Australia
Corresponding author: Wu, P. T.(scipapers@126.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: In order to improve the level of multi-functional and automatic observation of crop root system growth, a soil column monitoring system was designed to facilitate in situ dynamic monitoring of root growth and water consumption. The system consists of 20 plastic tubular backfill soil columns, each with an inner diameter of 32 cm and height of 300 cm. The crops were planted at the top of the soil column with the surrounding leveled with the ground surface and the site is in a greenhouse. The underground portion of the soil column contains small round windows on the tube through which root growth can be monitored, roots can be pruned and soil samples can be obtained. A multiport serial weighing system was designed and placed at the base of the soil column. Twenty electronic balances were connected to the personal computer through three CP-168U multiport serial cards and RS-232 serial cables. The host software was developed on the browser/server (Browser/Server), and data collection and remote data transmission and data sharing were implemented using the Java programming language and applying Internet data transmission technology and Web application technology. System tests showed a relatively good stability and real-time capability, and with accuracy up to 50 g and the evapotranspiration of each soil column was 0.25-0.65 kg per day. The root-system observation system developed in this study surpassed the traditional method of root-digging sampling and thus provided an alternative that could be used to automatically monitor the root system growth status.
Number of references: 18
Main heading: Soils
Controlled terms: Data communication systems - Monitoring - Personal computers - Plants (botany) - Water supply - Weighing
Uncontrolled terms: Dynamic monitoring - Electronic balances - Observation systems - Remote monitoring system - Root system - Soil column - Water consumption - Weighing systems
Classification code: 944 Moisture, Pressure and Temperature, and Radiation Measuring Instruments - 943.3 Special Purpose Instruments - 943 Mechanical and Miscellaneous Measuring Instruments - 942 Electric and Electronic Measuring Instruments - 941 Acoustical and Optical Measuring Instruments - 723 Computer Software, Data Handling and Applications - 722.4 Digital Computers and Systems - 718 Telephone Systems and Related Technologies; Line Communications - 717 Optical Communication - 716 Telecommunication; Radar, Radio and Television - 483.1 Soils and Soil Mechanics - 461.9 Biology - 446.1 Water Supply Systems
DOI: 10.3965/j.ijabe.20130602.00?

Database: Compendex

Data Provider: Engineering Village

16. Oligomer saccharide reduction during dilute acid pretreatment co-catalyzed with Lewis acids on corn stover biomass

Accession number: 20132616450152
Authors: Degenstein, John (1); Kamireddy, Srinivas Reddy (2); Tucker, Melvin P. (3); Ji, Yun (2)
Author affiliation: (1) Department of Chemical Engineering, Purdue University, West Lafayette, IN 47907, United States; (2) Department of Chemical Engineering, University of North Dakota, Grand Forks, ND, 58202, United States; (3) National Renewable Energy Laboratory, Golden, CO, 80401, United States
Corresponding author: Ji, Y.(yun.ji@engr.und.edu)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The dilute sulfuric acid pretreatment of lignocellulosic biomass is a well understood process that significantly enhances the yield of glucose after enzymatic saccharification. The goal of this research was to perform a systematic study to evaluate the yield of fermentable sugars during dilute sulfuric acid pretreatment that is co-catalyzed with the transition metal Lewis acid salts: AlCl3, FeCl2, FeCl3, and La(OTf)3. All Lewis acids apart from FeCl2 reduced the presence of xylo-oligomers by a large margin when compared to the non-co-catalyzed control sample pretreatments. The presence of these xylo-oligomers acts as inhibitors during enzymatic saccaharification step. The Lewis acids AlCl3, FeCl3, and La(OTf)3 were also able to marginally increase the overall enzymatic digestibility specifically for corn stover pretreated at 160°C with 10 mM of Lewis acids. The hard Lewis acid such as AlCl3 increased the formation inhibitory products such as furfural and 5-hydroxymethylfurfural (HMF). There was good correlation between reduction of xylo-oligomers and increased concentration furfural with increase in Lewis acid hardness.
Number of references: 32
Main heading: Oligomers
Controlled terms: Aldehydes - Biomass - Catalysis - Furfural - Sulfuric acid - Transition metal compounds - Transition metals
Uncontrolled terms: 5 hydroxymethyl furfurals - Corn stover - Dilute acid pretreatment - Dilute sulfuric acid pretreatment - Enzymatic saccharification - Lewis Acid - Lignocellulosic biomass - Pre-Treatment
Classification code: 525.1 Energy Resources and Renewable Energy Issues - 531 Metallurgy and Metallography - 802.2 Chemical Reactions - 804 Chemical Products Generally
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

17. Storage stability of freeze-dried colostral whey powders with different additives

Accession number: 20132616450156
Authors: Yu, Hua Ning (1, 2); Li, Yun Fei (1, 2); Guo, Ben Heng (1, 2)
Author affiliation: (1) State Key Laboratory of Dairy Biotechnology, Bright dairy and Food Co., Ltd, Shanghai 200436, China; (2) Department of Food Science and Technology, School of Agriculture and Biology, Bor S. Luh Food Safety Research Center, Shanghai Jiao Tong University, Shanghai 200240, China
Corresponding author: Guo, B. H.(gbhbrightdairy@hotmail.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013

Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Effects of different additives (sucrose and maltodextrin) on storage stability of colostral whey (CW) powders packaged in aluminium-laminated polyethylene pouches were investigated under different storage conditions (4°C and 40%-70% relative humidity (RH), 25°C and 50% RH, and 50°C and 20%-60% RH). All the samples stored under 50°C and 20%-60% RH showed the highest levels of lipid oxidation, Maillard reaction, proteolysis, and color difference, and the lowest immunoglobulin G (IgG) retention. Moisture contents showed an increase trend with increasing RH. Addition of sucrose into CW powders increased water adsorption capacity and Maillard reaction, whereas addition of maltodextrin showed the opposite effects. Maltodextrin as drying aids was suitable for keeping quality during storage. Sucrose did not clearly play any roles in protecting denaturation of IgG during 90-day storage. The low storage temperature and RH were helpful for keeping storage stability of CW powders with different additives.
Number of references: 35
Main heading: Powders
Controlled terms: Chemical reactions - Glycosylation - Polysaccharides - Stability - Sugar (sucrose)
Uncontrolled terms: Color difference - Colostral whey powders - Freeze drying - Maillard reaction - Maltodextrins - Storage condition - Storage stability - Water adsorption capacity
Classification code: 951 Materials Science - 931 Classical Physics; Quantum Theory; Relativity - 822.3 Food Products - 804.1 Organic Compounds - 961 Systems Science - 804 Chemical Products Generally - 801.2 Biochemistry - 801 Chemistry - 536 Powder Metallurgy - 802.2 Chemical Reactions
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

18. Chlorophyll extraction from leaves, needles and microalgae: A kinetic approach

Accession number: 20132616450157
Authors: Miazek, Krystian (1); Ledakowicz, Stanislaw (1)
Author affiliation: (1) Department of Bioprocess Engineering, Technical University of Lodz, 90 - 924, Lodz, Poland
Corresponding author: Miazek, K.(krystian136@yahoo.pl)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Currently, there is a strong focus on industrial production of chlorophyll as a natural pigment. Two factors are required in the economically feasible process to make chlorophyll production: material with high pigment content and efficient extraction mechanism. In this work, extraction of chlorophyll from harvested black locust (Robinia pseudoacacia) leaves, Scots pine (Pinus sylvestris) needles, field sow thistle (Sonchus arvensis) leaves, and green microalga (Chlorella sp.) was discussed. The highest pigment content was detected in Chlorella cells (4.46%) followed by black locust leaves (1.63%), sow thistle leaves (1.48%) and pine needles (0.38%). The chlorophyll extraction rate was the highest for black locust leaves (k = 3.59 h-1), sow thistle leaves (k = 2.90 h-1) and Chlorella cells (k = 2.80 h-1) with the use of methanol as a solvent. In investigated materials, needles showed higher resistance for chlorophyll extraction (k = 0.93 h-1) when compared to leaves and microalgae. Values of extraction kinetic constant were much lower for all materials (0.22 - 1.12 h-1) in the case of using ethanol as a solvent. Black locust leaves and Chlorella cells were proved to be the most attractive materials for chlorophyll production.
Number of references: 27
Main heading: Chlorophyll
Controlled terms: Algae - Extraction - Forestry - Microorganisms - Needles - Organic solvents
Uncontrolled terms: Chlorophyll extraction - Extraction kinetics - Extraction mechanisms - Industrial production - Leaves - Micro-algae - Pigment contents - Robinia pseudo-acacia

Classification code: 821.0 Woodlands and Forestry - 819.6 Textile Mills, Machinery and Equipment - 804.1 Organic Compounds - 803 Chemical Agents and Basic Industrial Chemicals - 802.3 Chemical Operations - 461.9 Biology - 461.2 Biological Materials and Tissue Engineering
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

19. Estimation of cotton yield with varied irrigation and nitrogen treatments using aerial multispectral imagery

Accession number: 20132616450150
Authors: Huang, Yan Bo (1); Sui, Rui Xiu (1); Thomson, Steven J. (1); Fisher, Daniel K. (1)
Author affiliation: (1) United States Department of Agriculture, Agricultural Research Service, Crop Production Systems Research Unit, Stoneville, MS, 38776, United States
Corresponding author: Huang, Y. B.(Yanbo.Huang@ars.usda.gov)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Cotton yield varies spatially within a field. The variability can be caused by various production inputs such as soil properties, water management, and fertilizer application. Airborne multispectral imaging is capable of providing data and information to study effects of the inputs on yield qualitatively and quantitatively in a timely and cost-effective fashion. A 10-ha cotton field with irrigation and non-irrigation 2×2 blocks was used in this study. Six nitrogen application treatments were randomized with two replications within each block. As plant canopy was closed, airborne multispectral images of the field were acquired using a 3-CCD MS4100 camera. The images were processed to generate various vegetation indices. The vegetation indices were evaluated for the best performance to characterize yield. The effect of irrigation on vegetation indices was significant. Models for yield estimation were developed and verified by comparing the estimated and actual yields. Results indicated that ratio of vegetation index (RVI) had a close relationship with yield (R2=0.47). Better yield estimation could be obtained using a model with RVI and soil electrical conductivity (EC) measurements of the field as explanatory variables (R2=0.53). This research demonstrates the capability of aerial multispectral remote sensing in estimating cotton yield variation, and providing methods for similar studies.
Number of references: 8
Main heading: Irrigation
Controlled terms: Cotton - Electric conductivity - Estimation - Geologic models - Nitrogen - Remote sensing - Vegetation - Water management
Uncontrolled terms: Data and information - Explanatory variables - Fertilizer applications - Multi-spectral imagery - Multispectral imaging - Multispectral remote sensing - Soil electrical conductivity - Yield
Classification code: 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 804 Chemical Products Generally - 731.1 Control Systems - 921 Mathematics - 701.1 Electricity: Basic Concepts and Phenomena - 446 Waterworks - 444 Water Resources - 481.1 Geology
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

20. Temperature measurement and analysis of postharvest agricultural products associated with thermal disinfestations

Accession number: 20132616450155
Authors: Yan, Rong Jun (1); Zhi, Huang (1); Rui, Li (1); Zhu, Han Kun (1); Ling, Bo (1); Wang, Shao Jin (1, 2)

Author affiliation: (1) College of Mechanical and Electronic Engineering, Northwest A and F University, Yangling, Shaanxi 712100, China; (2) Washington State University, Department of Biological Systems Engineering, Pullman, WA 99164-6120, United States
Corresponding author: Wang, S. J.(shaojinwang@nwsuaf.edu.cn)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Hot air and hot water treatments are practical, environmentally-friendly and non-chemical heating methods, which are widely used for postharvest insect control and quality preservation in agricultural products. Taking apple and pear as representative fruits, this study mainly analyzed the influences of their thermal properties, diameter, and medium speed on the heating rates of fruits through their real-time measured temperatures at surface and center. Based on the reported thermal death kinetic models of the target codling moth, the minimum heating time was estimated to achieve 100% of the insect mortality. The results showed that the heating rates in fruits decreased gradually with the increasing depth from the surface to the center. With increasing heating time, the heating rate became small. The apple was heated faster than the pear. Hot water was more effective than hot air in treating fruits. Increasing hot air speed increased the heating rate but increasing water circulating speed had no clear effects on the heating rate. Based on the measured temperature-time history of the fruit center, the minimum heating time could be effectively determined for codling moth control through the estimated total equivalent thermal lethal time. The results could provide reliable validation data for the computer simulation and a scientific basis to improve the hot air and hot water treatments.
Number of references: 28
Main heading: Fruits
Controlled terms: Agricultural products - Computer simulation - Heating - Heating rate - Insect control - Temperature measurement - Water
Uncontrolled terms: Environmentally-friendly - Equivalent thermal - Hot air - Hot water - Hot water treatment - Measured temperatures - Measurement and analysis - Scientific basis
Classification code: 944.6 Temperature Measurements - 821.4 Agricultural Products - 821.2 Agricultural Chemicals - 723.5 Computer Applications - 643.1 Space Heating - 641.2 Heat Transfer - 444 Water Resources
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

21. Telemetering system and its application for fruit cultivation in the greenhouse

Accession number: 20132616450147
Authors: Zhang, Dao Hui (1); Wang, Jia Wei (1); Zong, Xiao Juan (1); Wei, Hai Rong (1); Zhu, Dong Zi (1); Liu, Qing Zhong (1)
Author affiliation: (1) Key Laboratory of Fruit Tree Biotechnology Breeding, Shandong Institute of Pomology, Taian, Shandong 271000, China
Corresponding author: Liu, Q. Z.(qzliu001@126.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China

Abstract: Circuit of the temperature measurement equipment was improved in order to develop temperature telemetering system for cultivating fruit facilities. The traditional temperature measuring equipments used in monitoring temperature changes in greenhouse include mercury column, merbromine column, kerosene column glass rod thermometer and mechanical inductive thermometer. Compared with the traditional method of temperature measurement the new system reduces the labor requirement and promotes precision monitoring and control of the temperature. In addition, the temperature in the greenhouse was very accurate especially at night or in rainy and snowy weather. This new temperature telemetering system will promote the development of the fruit protection cultivation.
Number of references: 15
Main heading: Temperature measurement
Controlled terms: Fruits - Greenhouses - Telemetering systems - Thermometers
Uncontrolled terms: Glass rods - ITS applications - Labor requirements - Precision monitoring - Sweet cherries - Temperature changes - Temperature measure-ment and controls - Temperature measuring
Classification code: 944.6 Temperature Measurements - 944.5 Temperature Measuring Instruments - 821.6 Farm Buildings and Other Structures - 821.4 Agricultural Products - 718 Telephone Systems and Related Technologies; Line Communications - 717 Optical Communication - 716 Telecommunication; Radar, Radio and Television
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

22. Near-infrared-reflection spectroscopy as measuring method to determine the state of the process for automatic control of anaerobic digestion

Accession number: 20132616450153
Authors: Stockl, Andrea (1); Loeffler, Daniel (2); Oechsner, Hans (3); Jungbluth, Thomas (3); Fischer, Klaus (2); Kranert, Martin (2)
Author affiliation: (1) Dipl.-Ing. agr, Baden-W, Germany; (2) University of Stuttgart, Institute for Sanitary Engineering, Water Quality and Solid Waste Management, Bandt le 2, 70569 Stuttgart, Germany; (3) University of Hohenheim, State Institute of Agricultural Engineering and Bioenergy, 70593 Stuttgart-Plieningen, Germany
Corresponding author: Stockl, A.(andrea.stockl@uni-hohenheim.de)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: A recently developed control strategy for the anaerobic digestion process requires secure knowledge about the state of the process. The near infrared reflection spectroscopy (NIRS), provides the possibility to determine process parameters of the anaerobic digestion process online and directly at the digester. To investigate if the NIRS measurements can successfully be used for the characterization of the state of the process within the control strategy the control was operated on two experimental digesters. NIR spectra were recorded during the experiments. The values of the process parameters (mainly concentrations of organic acids) obtained by NIRS differ from the values of the chemical analyses during the experiment. Nevertheless the state of the process is categorized equally on the basis of both measurement methods. It can consequently be stated that NIRS is expected to scope with the requirements of the control strategy.
Number of references: 25
Main heading: Process control
Controlled terms: Anaerobic digestion - Automation - Biogas - Chemical analysis - Control - Electromagnetic wave reflection - Experiments - Infrared devices - Organic acids - Pulp digesters
Uncontrolled terms: Anaerobic digestion process - Automatic process control - Control strategies - Measurement methods - Near-infrared reflection spectroscopies - Near-infrared-reflection spectroscopy(NIRS) - Process parameters - State of the process
Classification code: 804.1 Organic Compounds - 804 Chemical Products Generally - 802.1 Chemical Plants and Equipment - 801 Chemistry - 901.3 Engineering Research - 741.3 Optical Devices and Systems - 711 Electromagnetic

Waves - 522 Gas Fuels - 452.4 Industrial Wastes Treatment and Disposal - 731 Automatic Control Principles and Applications
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

23. Power ultrasound for the preservation of postharvest fruits and vegetables

Accession number: 20132616450158
Authors: Xu, Yu Ting (1); Zhang, Li Fen (2); Zhong, Jian Jun (1); Shu, Jie (1); Ye, Xing Qian (1, 3); Liu, Dong Hong (1, 3)
Author affiliation: (1) School of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou, Zhengjiang 310058, China; (2) College of Food Science and Technology, Henan University of Technology, Zhengzhou, Henan 450001, China; (3) Fuli Institute of Food Science, Zhejiang University, Hangzhou, Zhengjiang 310058, China
Corresponding author: Donghong, L.(dhliu@zju.edu.cn)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Increasing public demands for improved safety and quality of fruits and vegetables in the fresh market, awaken a growing interest for novel technologies for the preservation of postharvest fruits and vegetables before storage. Ultrasound technology provides one of the methods that with better treating time, enhanced products quality, reduced chemical hazards, low consumption of energy, and is environmentally friendly. This review provides an up-to-date summary of published findings on the application of ultrasound in the preservation of fresh fruits and vegetables. Included are the ultrasound devices commonly utilized, effects of power ultrasound treatment as a factor that affects decay incidence, safety and quality of fresh fruits and vegetables. Application challenges and research trends in the future are also analyzed. It is concluded that much progress has been achieved in this field during recent years. These achievements paved the way for the industrial-scale application of ultrasound in the preservation of postharvest fruits and vegetables.
Number of references: 70
Main heading: Fruits
Controlled terms: Safety factor - Ultrasonics - Vegetables - Wood preservation
Uncontrolled terms: Environmentally-friendly - Fruits and vegetables - Industrial-scale applications - Low consumption - Power ultrasound - Products quality - Ultrasound devices - Ultrasound technology
Classification code: 662.1 Automobiles - 753.1 Ultrasonic Waves - 803 Chemical Agents and Basic Industrial Chemicals - 821.4 Agricultural Products
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

24. Status of flood vulnerability area in an ungauged basin, South-west Nigeria

Accession number: 20132616450149
Authors: Sobowale, A. (1, 2); Oyedepo, J.A. (1, 2)
Author affiliation: (1) South West Regional Center for National Water Resources Capacity Building Network, Federal University of Agriculture, P.M.B. 2240, Abeokuta, 110001, Nigeria; (2) Institute for Food Security, Environmental Resources and Agricultural Research, Federal University of Agriculture, P.M.B. 2240, Abeokuta, 110001, Nigeria
Corresponding author: Sobowale, A.(Sobowalea@unaab.edu.ng)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2

Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Many rivers in Nigeria had been ungauged in the last three decades; this worrisome scenario has impacted negatively on the livelihood of people who live in flood plains. The general lack of up to date streamflow data has made river basin management problematic especially in the area of flood risk management and the development of a real time flood warning system. Flood studies were carried out in the Ogun River basin in the South Western part of Nigeria using synthetic data generated by Rainfall-Runoff Modeling using a combination of the NRCS curve number model and digital terrain modeling using ArcGIS&reg 9.3 software to identify vulnerable areas in relation to synthesized flood waves generated from the basin, extent of inundation and ranking of the flash points was equally done using proximity to hazard source as a criteria. The total area in the basin covered by fresh water swamps/salt marsh/ tidal flats at the lower course of Ogun river is 49 km2 while the spatial extent of the entire wetland is 556 km2 accordingly; when a peak flood volume of 4 270 million cubic meters (MCM) generated in the month of September is routed into the fresh water swamp, about 33.4 m of flood depth was left unaccommodated which will cause inundation of the entire flood plain causing severe damage on its path. Over 1.4 million inhabitants were identified to be at risk in the area. When the entire wetland was considered, the flood wave was reduced to an average depth of 8.5 m which is still capable of causing grave damages in the remaining parts of the flood plain. The flood wave was found to have a residence time of about 45 days. Appropriate recommendations were given for practical adaptations.
Number of references: 14
Main heading: Floods
Controlled terms: Flood control - Information management - Management - Models - Water - Water management - Wetlands
Uncontrolled terms: Basin - Digital terrain modeling - Flood risk management - Flood vulnerabilities - Nigeria - Rainfall-runoff modeling - River basin management - Vulnerability
Classification code: 914.1 Accidents and Accident Prevention - 912.2 Management - 902.1 Engineering Graphics - 454.1 Environmental Engineering, General - 446 Waterworks - 444 Water Resources - 442.2 Land Reclamation
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

25. Factors affecting pellet quality and energy analysis of pelleting process

Accession number: 20132616450146
Authors: Adapa, Phani K. (1); Tabil, Lope G. (1); Schoenau, Greg J. (2)
Author affiliation: (1) Department of Chemical and Biological Engineering, University of Saskatchewan, Saskatoon, S7N 5A9SK, Canada; (2) Department of Mechanical Engineering, University of Saskatchewan, Saskatoon, S7N 5A9 SK, Canada
Corresponding author: Adapa, P. K.(phani.adapa@usask.ca)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Agricultural biomass residue such as barley, canola, oat and wheat straw has the potential to be used for sustainable production of bio-fuels and offset greenhouse gas emissions. The biomass substrate must be processed and handled in an efficient manner in order to reduce industry's operational cost as well as meet the requirement of raw material for biofuel production. Biomass has low bulk density, making it difficult and costly to store and transport in its native loose form. Therefore, in this study, an integrated approach to densification of non-treated and steam exploded barley, canola, oat and wheat straw was developed. During this process, the significance of major contributing factors (independent variables such as biomass type, treatment, pressure and grind size) on pellet density, durability and

specific energy were determined. It has been found that applied pressure (60.4%) was the most significant factor affecting pellet density followed by the application of steam explosion pre-treatment (39.4%) for lab-scale single pelleting experiments. Similarly, the type of biomass (47.1%) is the most significant factor affecting durability followed by the application of pre-treatment (38.2%) and grind size (14.6%) for pellets manufactured using the pilot-scale pellet mill. Also, applied pressure (58.3%) was the most significant factor affecting specific energy required to manufacture pellets followed by the biomass (15.3%), pre-treatment (13.3%) and grind size (13.2%), which had lower but similar effect on specific energy for lab-scale single pelleting experiments. Overall energy analysis of post-harvest processing and densification of agricultural straw was performed, which showed that a significant portion of original agricultural biomass energy (89%-94%) is available for the production of biofuels. Almost, similar amount of specific energy is required to produce pellets from barley, canola, oat and wheat straw grinds. Customized pellets having steam exploded straw required more energy to manufacture resulting in availability of only 89% of total energy for biofuel production.
Number of references: 53
Main heading: Pelletizing
Controlled terms: Agriculture - Biofuels - Biomass - Densification - Density (specific gravity) - Durability - Energy management - Experiments - Gas emissions - Greenhouse gases - Manufacture - Steam - Straw - Substrates
Uncontrolled terms: Barley straws - Canola straws - Pre-Treatment - Specific energy - Steam explosion - Wheat straws
Classification code: 931.2 Physical Properties of Gases, Liquids and Solids - 614 Steam Power Plants - 801 Chemistry - 802.3 Chemical Operations - 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 821.5 Agricultural Wastes - 901.3 Engineering Research - 537.1 Heat Treatment Processes - 524 Solid Fuels - 523 Liquid Fuels - 461 Bioengineering and Biology - 451.1 Air Pollution Sources - 421 Strength of Building Materials; Mechanical Properties - 525 Energy Management and Conversion
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

26. Effects of condensed distillers solubles and drying temperature on the physico-chemical characteristics of laboratory-prepared wheat distillers grain with soluble

Accession number: 20132616450154
Authors: Mosqueda, Maria Rosario P. (1); Tabil, Lope G. (1); Muthukumarappan, Kasiviswanathan (2)
Author affiliation: (1) Department of Chemical and Biological Engineering, University of Saskatchewan, Saskatoon, SK S7N 5A9, Canada; (2) Department of Agricultural and Biosystems Engineering, South Dakota State University, Brookings, SD 57007, United States
Corresponding author: Tabil, L. G.(lope.tabil@usask.ca)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Samples of wheat distillers grain with solubles were prepared at 15%, 30%, and 45% condensed distillers solubles (CDS) and dried under 40°C, 80°C, and 120°C to examine the effects of CDS level and drying temperature on their chemical, physical, flow, compression, thermal, and frictional properties. As CDS level increased, protein and ash contents increased while fat and fiber contents decreased. Fat and acid detergent fiber contents were also markedly affected by drying temperature. While CDS level, drying temperature, and their interaction significantly affected a number of the physical properties, results suggest that CDS level had a stronger influence. Samples with high CDS level, for example, were significantly finer, denser, less flowable, and less dispersible than those with lower CDS. These samples also had significantly higher thermal diffusivity and coefficient of internal friction and produced pellets with higher failure stresses than those with lower CDS. Their pellet density increased with CDS level and was also significantly affected by drying temperature. Further, the samples were classified as fairly flowable and floodable and their compression characteristics were adequately described by the Kawakita-Ludde model.
Number of references: 37
Main heading: Grain (agricultural product)

Controlled terms: Data compression - Drying - Pelletizing - Physical properties
Uncontrolled terms: Acid detergent fiber - CdS - Chemical compositions - Compression characteristics - DDGS - Distillers grains - Frictional properties - Physicochemical characteristics
Classification code: 642.1 Process Heating - 716.1 Information Theory and Signal Processing - 802.3 Chemical Operations - 821.4 Agricultural Products - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

27. Fuel ethanol production using novel carbon sources and fermentation medium optimization with response surface methodology

Accession number: 20132616450151
Authors: Wu, Wei Hua (1)
Author affiliation: (1) Department of Biological and Agricultural Engineering, University of California, Davis, CA, 95616, United States
Corresponding author: Wu, W. H.(whwu@ucdavis.edu)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 2
Issue date: 2013
Publication year: 2013
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: In this study, ethanol production abilities of the novel carbon sources: sodium and calcium gluconate in different minimal and rich medium were compared with glucose using Escherichia coli KO11. The strain produced higher ethanol yield in the rich medium Luria-Bertani (LB) than the other two minimal media: corn steep liquor (CSL) and M9 for two substrates (sodium and calcium gluconate). Additionally, higher ethanol yields were achieved when the strain was grown in LB and M9 medium with calcium gluconate than sodium gluconate, while the ethanol yields were similar when both sodium and calcium gluconate were added into CSL medium respectively. Response surface methodology was used to optimize the fermentation medium components for enhancing ethanol production using strain E. coli KO11 in CSL medium with calcium gluconate as the substrate in batch culture. The concentration of the potassium phosphate buffer is the only significant factor among five factors considered. A quadratic model was developed to describe the relationship between ethanol production and the factors. The optimal conditions predicted for five factors were 14.38 g/L CSL, 0.0398 g/L FeCl3&middot6H2O, 1.12 g/L MgSO4&middot6H2O, 15.41 g/L (NH4)2SO4, and 1.58/1.26 g/L KH2PO4/K2HPO4 (2:1 molar ratio). The highest ethanol concentration under optimal conditions was 31.5 g/L, which was 5.6 g/L higher than that from the same fermentation concentration of calcium gluconate in LB media. The high correlation between the predicted and experimental values confirmed the validity of the model.
Number of references: 23
Main heading: Calcium
Controlled terms: Batch cell culture - Biofuels - Carbon - Escherichia coli - Ethanol - Fermentation - Optimization - Substrates - Surface properties
Uncontrolled terms: Escherichia coli KO11 - Ethanol concentrations - Ethanol production - Experimental values - Fermentation medium - Medium optimization - Potassium phosphate - Response surface methodology
Classification code: 951 Materials Science - 921.5 Optimization Techniques - 804 Chemical Products Generally - 801.2 Biochemistry - 801 Chemistry - 549.2 Alkaline Earth Metals - 524 Solid Fuels - 523 Liquid Fuels - 461 Bioengineering and Biology
DOI: 10.3965/j.ijabe.20130602.00?
Database: Compendex

Data Provider: Engineering Village

28. Estimation of citrus canker lesion size using hyperspectral reflectance imaging

Accession number: 20133916790601

Authors: Niphadkar, Nikhil P. (1); Burks, Thomas F. (2); Qin, Jian Wei (3); Ritenour, Mark A. (4)
Author affiliation: (1) ATW Automation Inc., Dayton, OH 45402, United States; (2) Department of Agricultural and Biological Engineering, University of Florida, Gainesville, FL 32611, United States; (3) U.S. Department of Agriculture, Beltsville, MD 20705, United States; (4) Department of Horticultural Sciences, University of Florida, Gainesville, FL 34945, United States
Corresponding author: Niphadkar, N. P.(nniphadkar@atwautomation.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 41-51
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The Citrus industry has need for effective approaches to remove fruit with canker before they are shipped to selective international market such as the European Union. This research aims to determine the detectable size limit for cankerous lesions using hyperspectral imaging approaches. Previously developed multispectral algorithms using visible to near-infrared wavelengths, were used to segregate cankerous citrus fruits from other peel conditions (normal, greasy spot, insect damage, melanose, scab and wind scar). However, this previous work did not consider lesion size. A two-band ratio method with a simple threshold based classifier (ratio of reflectance at wavelengths 834 nm and 729 nm), which gave maximum overall classification accuracy of 95.7%, was selected for lesion size estimation in this study. The smallest size of cankerous lesion detected in terms of equivalent diameter was 1.66 mm. The effect of variation of threshold values and number of erosion cycles (applying morphological erosion multiple times to the image) on estimation of smallest detectable lesion was observed. It was found that small threshold values gave better canker classification accuracies, while exhibiting a lower overall classification accuracy. Meanwhile, higher threshold values portrayed the opposite tendency. The threshold value of 1.275 gave the optimum tradeoff between canker classification accuracy, overall classification accuracy and minimal lesion size detection. Increasing the number of erosion cycles reduced detection rates of smaller canker lesions, leading to the conclusion that a single erosion cycle gave the best size estimation results. The erosion kernel of the size 3 mm × 3 mm was used during the exploration.
Number of references: 13
Main heading: Estimation
Controlled terms: Algorithms - Citrus fruits - Erosion - Image classification - International trade - Reflection - Spectroscopy
Uncontrolled terms: Citrus canker - Disease detection - Hyperspectral reflectance - Lesion size - Multi-spectral - Size detection
Classification code: 902.3 Legal Aspects - 821.4 Agricultural Products - 801 Chemistry - 921 Mathematics - 716 Telecommunication; Radar, Radio and Television - 483 Soil Mechanics and Foundations - 407 Maritime and Port Structures; Rivers and Other Waterways - 711 Electromagnetic Waves
DOI: 10.3965/j.ijabe.20130603.006
Database: Compendex

Data Provider: Engineering Village

29. Influences of microwave vacuum puffing conditions on anthocyanin content of raspberry snack

Accession number: 20133916790605
Authors: Mu, Yan Qiu (1); Zhao, Xin Huai (1); Liu, Bing Xin (1); Liu, Cheng Hai (1); Zheng, Xian Zhe (1)
Author affiliation: (1) Northeast Agricultural University, Harbin, 150030, China
Corresponding author: Zheng, X. Z.(zhengxz@neau.edu.cn)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013

Pages: 80-87
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Microwave technology is fit for the processing of berry products, but it may affect nutrition components of berry fruit. To improve the nutritional value of the berry products, the influences of microwave vacuum puffing conditions on the anthocyanin content of raspberry snack were investigated using central composite experiments. Results indicated that vacuum pressure had the most significant effect on the anthocyanins of berry snack, followed by the puffing time, microwave power, and initial moisture content. The interaction between microwave power and puffing time on the anthocyanins was extremely significant. Under microwave power of 2.68 kW and the puffing time of 81.00 s, the anthocyanin content of raspberry snack was retained at high level. The results can provide some technological basis for the berry fruit products processed with high quality.
Number of references: 25
Main heading: Fruits
Controlled terms: Anthocyanins - Microwave devices - Microwave generation - Microwave power transmission - Nutrition - Vacuum
Uncontrolled terms: Absorbances - Anthocyanin content - Microwave-vacuum - Processing condition - Raspberry snack
Classification code: 821.4 Agricultural Products - 804.1 Organic Compounds - 715 Electronic Equipment, General Purpose and Industrial - 714 Electronic Components and Tubes - 706.1.1 Electric Power Transmission - 633 Vacuum Technology - 461.7 Health Care
DOI: 10.3965/j.ijabe.20130603.0010
Database: Compendex

Data Provider: Engineering Village

30. Modulation of fasting blood glucose by raw banana powder in alloxan-induced diabetic rats

Accession number: 20133916790607
Authors: Bai, Yong Liang (1); Yu, Ming (1); Du, Bing (1); Chen, Qing Fa (1); Yang, Gong Ming (1)
Author affiliation: (1) College of Food Science, South China Agricultural University, Guangzhou 510642, China
Corresponding author: Yang, G. M.(ygm576@163.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 94-102
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: This study aimed to observe the influence of raw banana powder (RBP) on fasting blood glucose (FBG), blood lipid and other biochemical indicators in type-2 diabetic rats and therefore to provide experimental evidences for developing suitable food from banana powder for diabetic patients. Eight Sprague-Dawley rats were selected randomly as the normal control group (NCG) before the experiment. After establishing type-2 diabetic rat models (11.1-16.7 mmoL/L) by alloxan, 32 rats were divided into four groups: the diabetic control group (DCG, n=8), low-dose group (LDG, n=8), middle-dose group (MDG, n=8) and high-dose group (HDG, n=8). The LDG, MDG and HDG rats received gastric perfusion of RBP at the doses of 2 g/kg, 4 g/kg and 6 g/kg per day, respectively. After four weeks, oral glucose tolerance test was carried out in each group, and then the FBG level, blood lipid, insulin, short chain fatty acids content, pH value of colon content and other biochemical indicators of rats in each group were determined and compared among the groups. Results showed that the levels of FBG significantly decreased in the LDG (11.97±0.83), MDG (8.95±0.45) and HDG (9.28±1.45), compared with their initial values (13.00±1.25, 13.68±0.75 and 13.91±0.80, respectively). The FBG levels in these three groups were obviously lower than that in the DCG. However, there were no dramatic FBG changes in the NCG and DCG (5.77±0.59, 14.14±0.72) compared with the initial stage (5.55±0.23,

13.93±0.47). The RBP intervention increased insulin-sensitivity index and regulated postprandial blood glucose. Besides, RBP showed the positive effects on symptoms of type 2 diabetic rats, such as the reduction of weight gain and total cholesterol.
Number of references: 50
Main heading: Rats
Controlled terms: Blood - Fruits - Glucose - Insulin - Lipids
Uncontrolled terms: Biochemical indicators - Blood glucose - Diabetic rats - Dietary fibers - Experimental evidence - Oral glucose tolerance tests - Resistant starch - Short-chain fatty acids
Classification code: 461 Bioengineering and Biology - 804.1 Organic Compounds - 821.4 Agricultural Products
DOI: 10.3965/j.ijabe.20130603.0012
Database: Compendex

Data Provider: Engineering Village

31. Influence of ripening conditions on Scamorza cheese quality

Accession number: 20133916790604
Authors: Sorrentino, Elena (1, 2); Tipaldi, L. (1); Pannella, G. (1); La Fianza, G. (1); Succi, M. (1); Tremonte, P. (1)
Author affiliation: (1) Department of Agriculture, Environment and Food, University of Molise, Campobasso 86100, Italy; (2) Institute of Food Sciences, National Research Council (ISA-CNR), Avellino 83100, Italy
Corresponding author: Sorrentino, E.(sorrentino@unimol.it)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 71-79
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Scamorza is a pasta filata cheese produced in Southern Italy and eaten after a short ripening. The ripening phase is critical in defining the main qualitative features of the Scamorza cheese. The success of this operation is conditioned not only by the process parameters, but also by the characteristics of the ripening room in which different microclimates originate. This work intended to evaluate the influence of the different positions of cheeses within the ripening room on the evolution of their qualitative characteristics during the process of drying/ripening. For this purpose, samples of Scamorza cheese, produced in the Molise Region (Italy), were divided into two batches (C and L) and subjected to ripening for seven days in a thermo thermo-regulated room. The two batches were placed in different points of the room: the batch C in the central area and the batch L in the lateral area. During the ripening, temperature, humidity and air flow were monitored and the Scamorza cheeses were analysed to assess some qualitative characteristics. In a ripening room, the created microclimates are able to influence the quality of the product, as demonstrated by data related to temperature, humidity and air flow. In fact, from the results obtained, some appreciable differences among products from batches C and L were observed for the weight loss, the water activity and the colorimetric indexes. Differences in the behaviour of mesophilic lactic acid bacteria, pH and acidity were also found. The more rapid loss of water, characterizing the batch C, resulted in an evolution of physicochemical, physical and microbiological features, which resulted different from those observed in the samples from the batch L. Therefore, the results obtained in this study point out that, within the ripening room, the formation of different micro-environments is able to strongly influence the definition of the qualitative characteristics of the products placed in it.
Number of references: 22
Main heading: Air
Controlled terms: Bacteria - Drying - Lactic acid
Uncontrolled terms: Air flow - Cheese quality - Lactic acid bacteria - Pasta filata - Ripening - Ripening room
Classification code: 461.9 Biology - 642.1 Process Heating - 804 Chemical Products Generally - 804.1 Organic Compounds
DOI: 10.3965/j.ijabe.20130603.009
Database: Compendex

Data Provider: Engineering Village

32. Financial management for custom hire service of tractor in Bangladesh

Accession number: 20133916790599
Authors: Rahman, Anisur (1); Latifunnahar, Most. (1); Alam, Md Monjurul (1)
Author affiliation: (1) Department of Farm Power and Machinery, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh
Corresponding author: Rahman, A.(anis_fpm@bau.edu.bd)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 28-33
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The main purpose of the study was to determine the economic parameters and effective schedules for tractor operation. Secondary data from various sources were used in this research. Some essential data were collected from primary sources through survey. Operating costs were calculated and project financial profitability was determined by four major factors on farm financial measurement techniques, namely, benefit-cost ratio (BCR), net present value (NPV), internal rate of return (IRR), and payback period. Considering the economic use, land topography and cropping pattern was developed to effective scheduling for tractor operation. The operating cost of tractor with implement was found to be US$ 9.25 per hectare. For replacement of the existing tractor on expiry of economic life, the entrepreneur has to save an amount of US$ 219 per year in a bank account. Based on the operating cost, annual savings for replacement and a profit margin for the entrepreneur, the rent-out charge of the tractor is estimated at US$ 11.58 per hectare. Considering 10% interest rate, the NPV of the tractor at existing condition is US$ 18 757. The NPV of tractor indicates that tractor entrepreneurship is considered financially sound and the project is financially viable, with an average IRR of 36.96%. This is because IRR of the tractor was higher than the bank interest rate and it is highly profitable from the viewpoint of individual investors. The Payback period of tractor with implement was determined as 2.03 yrs. The minimum tenure for an economic use of a common tractor used in agriculture is about 6 310 hrs. Above this critical use, the utilization of a tractor is economical for a tractor entrepreneur. Depending on the cropping pattern two major and one minor turn-around periods are available in between cropping seasons for tilling operation. The time available for tilling of land is estimated about 140 days at 12 hours a day in a year. To strengthen the existing capacity of the tractor customer hire service entrepreneurs and develop new entrepreneur, appropriate adoption and dissemination programs must be launched in all over Bangladesh.
Number of references: 5
Main heading: Tractors (truck)
Controlled terms: Earnings - Economic and social effects - Investments - Operating costs - Profitability - Scheduling - Tractors (agricultural)
Uncontrolled terms: Bangladesh - Benefit cost ratios - Cropping patterns - Economic parameters - Financial managements - Financial profitabilities - Internal rate of return - Measurement techniques
Classification code: 663.1 Heavy Duty Motor Vehicles - 911.2 Industrial Economics - 912.2 Management
DOI: 10.3965/j.ijabe.20130603.004
Database: Compendex

Data Provider: Engineering Village

33. Design and experiment on intelligent fuzzy monitoring system for corn planters

Accession number: 20133916790597
Authors: Du, Rui Cheng (1); Gong, Bing Cai (1); Liu, Ning Ning (1); Wang, Chen Chen (1); Yang, Zi Dong (1); Ma, Ming Jian (1)
Author affiliation: (1) School of Agriculture and Food Engineering, Shandong University of Technology, Zibo 255049, Shandong, China
Corresponding author: Du, R. C.(drc@sdut.edu.cn)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6

Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 11-18
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: When sowing summer corn without tillage, it is necessary to ensure that the furrow opener is free from straw congestion and that the spacing of the sowing can be adjusted according to the breeds of corn and the preset seeding rate per acre. On the basis of the structural features of newly developed no-tillage corn fertilizers, an intelligent fuzzy monitoring system for corn planters was developed in this study. The system facilitates automatic control of the spacing adjustment and the status monitor for the fertilizer tank, seed tank, and seeding orifice. According to the preset number of rows, line spacing, number of plants per acre, and seed germination rate, the control rate can be calculated through designing in surveillance software. The control rate is output to the fuzzy controller through the digital output module of the CAN bus. Fuzzy control is applied to the DC motor for stepless adjustment of the spacing. A system for video surveillance of the working status of a planter is developed for displaying a real-time video image of the planter operation and achieving an anti-congestion status monitoring of a no-tillage planting operation in a dusty environment. Through field trials, the detection accuracy was 91.4%. The seed-clogging fault-alarm accuracy was 96.0%. The entire system remained stable and reliable.
Number of references: 11
Main heading: Seed
Controlled terms: Agriculture - Automation - Control - DC motors - Fertilizers - Fuzzy control - Monitoring - Plants (botany) - Security systems - Tanks (containers)
Uncontrolled terms: Corn planters - Detection accuracy - Fuzzy monitoring systems - Monitoring system - Plant spacing - Stepless adjustment - Structural feature - Video surveillance
Classification code: 944 Moisture, Pressure and Temperature, and Radiation Measuring Instruments - 821.4 Agricultural Products - 914.1 Accidents and Accident Prevention - 921 Mathematics - 941 Acoustical and Optical Measuring Instruments - 942 Electric and Electronic Measuring Instruments - 943 Mechanical and Miscellaneous Measuring Instruments - 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 732 Control Devices - 731 Automatic Control Principles and Applications - 705.3.2 DC Motors - 619.2 Tanks - 461.9 Biology - 804 Chemical Products Generally
DOI: 10.3965/j.ijabe.20130603.002
Database: Compendex

Data Provider: Engineering Village

34. Performance evaluation of cone penetrometer device for measuring the subsoil compaction in mulched plots

Accession number: 20133916790598
Authors: Thiyagarajan, R. (1); Jayashree, G.C. (2); Mohankumar, A.P. (3); Vijayakumary, P. (1)
Author affiliation: (1) Agricultural Engineering College and Research Institute, Tamil Nadu Agricultural University, Kumulur 621712, Tamil Nadu, India; (2) Department of Agricultural Engineering, University of Agricultural Sciences, Bangalore-560065, Karnataka, India; (3) Agricultural Engineering College and Research Institute, Tamil Nadu Agricultural University, Coimbatore 641003, Tamil Nadu, India
Corresponding author: Thiyagarajan, R.(drrthiyagarajan@gmail.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 19-27
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China

Abstract: Soil exhibits layers of extreme compaction from both natural causes and wheel traffic. These compaction layers impede root growth, thereby reducing the plants capacity to obtain water during drought. Subsoil tillage is a remedy for adverse soil compaction that results in improved conditions for crop growth. Mechanical disturbance of subsoil increases water holding capacity and reduces impedance to root penetration. Vertical mulching is a technique that can be used to partially alleviate soil compaction within the critical root zones of deep rooted crops. A study was conducted by placing raw and composted coir pith using a two row subsoil coir pith mulching machine in three different soil depths (250, 350, and 450 mm) at the three application rates of 15 t/ha, 20 t/ha, and 25 t/ha and the effect of soil strength was investigated. The experiment was conducted for a rainfed cotton crop. The soil strength profile was recorded in all the treatments. The cone penetrometer resistance was measured for each increment of 10 mm and recorded manually from a digital force indicator during maturity stages of crop in all the treatment plots. The cone penetrometer resistance was measured directly on the row and the cone index was computed. Deep placement of mulch reduced the soil strength as compared to shallow placement. The lower soil strength (0.5 kPa to 0.8 kPa) in the loosened and mulched zone provided an impedance free zone for the root to proliferate. The rapid increase in cone index values at depths immediately below the respective depth of placement (250, 350 and 450 mm) of raw and composted coir pith mulch indicated that the existence of undisturbed soil profile below the mulched zone which could be potential limiting factor for root development.
Number of references: 19
Main heading: Soils
Controlled terms: Compaction - Crops - Soil mechanics - Soil testing
Uncontrolled terms: Application rates - Coir pith - Cone index - Cone penetrometers - Mechanical disturbance - Soil strength - Undisturbed soils - Water holding capacity
Classification code: 483.1 Soils and Soil Mechanics - 536.1 Powder Metallurgy Operations - 821.4 Agricultural Products
DOI: 10.3965/j.ijabe.20130603.003
Database: Compendex

Data Provider: Engineering Village

35. Drying characteristics and quality of bananas under infrared radiation heating

Accession number: 20133916790603
Authors: Pekke, Milly A. (1); Pan, Zhong Li (2, 3); Atungulu, Griffiths G. (3, 4); Smith, Gary (1); Thompson, James F. (3)
Author affiliation: (1) Department of Food Science and Technology, University of California Davis, Davis, CA 95616, United States; (2) Processed Foods Research Unit, USDA-ARS Western Regional Research Center, Albany, CA 94710, United States; (3) Department of Biological and Agricultural Engineering, University of California Davis, Davis, CA 95616, United States; (4) Department of Food Science, University of Arkansas, Fayetteville, AR 72704, United States
Corresponding author: Pan, Z. L.(zhongli.pan@ars.usda.gov)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 58-70
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Hot air (HA) drying of banana has low drying efficiency and results in undesirable product quality. The objectives of this research were to investigate the feasibility of infrared (IR) heating to improve banana drying rate, evaluate quality of the dried product, and establish models for predicting drying characteristics. Banana slices of 5 mm and 8 mm thickness were dried with IR and HA at product temperatures of 60°C, 70°C and 80°C. Banana drying characteristics and changes in residual polyphenol oxidase (PPO), Hydroxymethylfurfural (HMF), color, moisture content (MC) and water activity during the treatments were investigated. Results showed that significant moisture reduction and higher drying rates were achieved with IR drying compared to HA drying in the early stage. The drying data could be fitted to the Page model for accurate prediction of MC change for IR and HA drying with mean R2 of 0.983. It was noted that enzyme inactivation occurred more quickly with IR than with HA drying. A unique response of PPO under IR and HA drying was revealed. IR heating of banana inactivated PPO within the first 20 min of drying

at 60°C, 70°C and 80°C, while PPO was first activated before inactivation at 60°C and 70°C drying with HA. The highest HMF content occurred in banana slices with 5 mm thickness dried with IR at a product temperature of 80°C. It is therefore recommendable to dry banana with IR at product temperature of 70°C or below to preserve the product quality. These findings are new and provide more insight in the application of IR heating for drying banana for improved drying rate and product quality.
Number of references: 47
Main heading: Fruits
Controlled terms: Dryers (equipment) - Drying - Enzymes - Infrared drying - Infrared heating - Infrared radiation - Quality control
Uncontrolled terms: Accurate prediction - Banana - Drying characteristics - Enzyme inactivation - Hot air drying - Hydroxymethylfurfural - Infrared radiation heating - Moisture reduction
Classification code: 913.3 Quality Assurance and Control - 821.4 Agricultural Products - 804.1 Organic Compounds - 802.1 Chemical Plants and Equipment - 741.3 Optical Devices and Systems - 741.1 Light/Optics - 642.1 Process Heating
DOI: 10.3965/j.ijabe.20130603.008
Database: Compendex

Data Provider: Engineering Village

36. Development and prospect of unmanned aerial vehicle technologies for agricultural production management

Accession number: 20133916790596
Authors: Huang, Yan Bo (1); Thomson, Steven J. (1); Hoffmann, W. Clint (2); Lan, Yu Bin (2); Fritz, Bradley K. (2)
Author affiliation: (1) United States Department of Agriculture, Agricultural Research Service, Crop Production Systems Research Unit, Stoneville, MS 38776, United States; (2) United States Department of Agriculture, Agricultural Research Service, Areawide Pest Management Research Unit, College Station, TX 77845, United States
Corresponding author: Huang, Y. B.(yanbo.huang@ars.usda.gov)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 1-10
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Unmanned aerial vehicles have been developed and applied to support agricultural production management. Compared with piloted aircraft, an Unmanned Aerial Vehicle (UAV) can focus on small crop fields at lower flight altitudes than regular aircraft to perform site-specific farm management with higher precision. They can also "fill in the gap" in locations where fixed winged or rotary winged aircraft are not readily available. In agriculture, UAVs have primarily been developed and used for remote sensing and application of crop production and protection materials. Application of fertilizers and chemicals is frequently needed at specific times and locations for site-specific management. Routine monitoring of crop plant health is often required at very high resolution for accurate site-specific management as well. This paper presents an overview of research involving the development of UAV technology for agricultural production management. Technologies, systems and methods are examined and studied. The limitations of current UAVs for agricultural production management are discussed, as well as future needs and suggestions for development and application of the UAV technologies in agricultural production management.
Number of references: 47
Main heading: Unmanned aerial vehicles (UAV)
Controlled terms: Aircraft - Crops - Cultivation - Industrial management - Remote sensing - Sensors - Technology
Uncontrolled terms: Aerial application technology - Agricultural production management - Application of fertilizers - Development and applications - Precision Agriculture - Rotary winged aircraft - Site specific management - Very high resolution
Classification code: 912.2 Management - 901 Engineering Profession - 821.4 Agricultural Products - 821.3 Agricultural Methods - 801 Chemistry - 731.1 Control Systems - 652.1 Aircraft, General
DOI: 10.3965/j.ijabe.20130603.001

Database: Compendex

Data Provider: Engineering Village

37. Poverty alleviation and resource conservation through development of cost effective technology at foot hill of Shivalik - A case study

Accession number: 20133916790600
Authors: Kumar, R. (1); Singh, P.K. (2); Langoo, B.A. (1)
Author affiliation: (1) Division of Agricultural Engineering, Sher-e-Kashmir Univeristy of Agricultural Sciences and Techonology Kashmir, Srinagar (J and K), India; (2) Department of soil and water Engineering, College of Technology and Engineering, Udaipur (Raj), India
Corresponding author: Kumar, R.(rohituhf@rediffmail.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 34-40
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The study revealed the development of cost effective technology utilized as a practical tool for treatment of seasonal torrent and addressing erosion problems and land use planning. Technology was implemented in a small agricultural watershed located in foot hill of Shivalik, India, to assess its prediction capacity of runoff, peak runoff flow and sediment yield. Cost effective technology was evaluated at the event scale by using a database of hydrological, geomorphologic and land use data collected during a two-year period. In the catchment, the gullies which are small to medium in size were treated with gully plugging by erecting loose boulder check dams and erected with different species of plants. Different types of spur were constructed with vegetative reinforcement for channelization of stream flow. The sediments deposited in the first year at downstream was recorded 0.09-81.0 tons, while in the second year it was reduced up to 0.07-16.7 tons. Similarly, up stream sediment deposition was recorded 1.0-72.0 tons and 0.37-13.1 tons in two consecutive years. The D-50 analysis of sediment deposited was carried in three different places of torrent and it was found that deposited particle size material decreased after treatment undertaken in the torrent bed. Therefore, the mechanical as well as vegetative measures helped in the channelization of water course towards the central line with the tune of 10-100 m, stabilization of torrent bed and reclamation of degraded land.
Number of references: 9
Main heading: Technology
Controlled terms: Agricultural runoff - Catchments - Cost effectiveness - Filter banks - Land reclamation - Land use - Landforms - Natural resources - Particle size - Sediments - Soil conservation - Stream flow - Water conservation - Water management
Uncontrolled terms: Agricultural watersheds - Cost-effective technology - D-50 - Integrated watershed management - Mechanical measures - Poverty alleviation - Resource conservation - Vegetative measures
Classification code: 912.3 Operations Research - 901 Engineering Profession - 821.5 Agricultural Wastes - 716 Telecommunication; Radar, Radio and Television - 713 Electronic Circuits - 943.2 Mechanical Variables Measurements - 631.1 Fluid Flow, General - 483 Soil Mechanics and Foundations - 481.1 Geology - 444 Water Resources - 442.2 Land Reclamation - 483.1 Soils and Soil Mechanics
DOI: 10.3965/j.ijabe.20130603.005
Database: Compendex

Data Provider: Engineering Village

38. Separation of shelled walnut particles using pneumatic method

Accession number: 20133916790606
Authors: Nahal, A. Mokhtari (1); Arabhosseini, A. (1); Kianmehr, M.H. (1)
Author affiliation: (1) Department of Agrotechnology, College of Abouraihan, University of Tehran, Pakdasht 3391653755, Tehran, Iran
Corresponding author: Arabhosseini, A.(ahosseini@ut.ac.ir)

Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 88-93
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Separation of shelled walnut particles was studied on two varieties of Persian walnut, Poost-Kaghazi and Poost-Sangi using pneumatic method. The moisture contents of the samples were determined. The particles were considered in three categories of shell, kernel and shell-kernel together. Each category was manually classified based on their size, in three portions of 1/8, 1/4, and 1/2, as well as the whole kernel and whole walnut. The terminal velocity of each group was determined. The shelled walnuts were sieved and classified in three groups of small, medium and large. The effects of separation time (5, 10 and 15 seconds), feeding value (50 to 80 gr) and air velocity on separation of the kernels and shells were studied for both varieties. The interaction effects were also studied for three walnut sizes (small, medium and large). The terminal velocity was the highest for the whole walnut and the whole kernel while it was lowest for 1/4 and 1/8 of the shell. The best separation was performed at air velocities of 9.20, 10.04 and 10.94 m/s with 98.2%, 98.9% and 98.2%, respectively.
Number of references: 28
Main heading: Separation
Controlled terms: Air - Pneumatic control - Pneumatics - Shells (structures) - Velocity
Uncontrolled terms: Persians - Postharvest - Shelled walnut - Terminal velocity - Walnut
Classification code: 408.2 Structural Members and Shapes - 632.3 Pneumatics - 802.3 Chemical Operations - 804 Chemical Products Generally - 931.1 Mechanics
DOI: 10.3965/j.ijabe.20130603.0011
Database: Compendex

Data Provider: Engineering Village

39. Recognition algorithm for plant leaves based on adaptive supervised locally linear embedding

Accession number: 20133916790602
Authors: Yan, Qing (1); Liang, Dong (1); Zhang, Dong Yan (1, 2); Wang, Xiu (2)
Author affiliation: (1) Key Laboratory of Intelligent Computing and Signal Processing, Ministry of Education, Anhui University, Hefei 230039, China; (2) Beijing Research Center for Information Technology in Agriculture, Beijing 100097, China
Corresponding author: Zhang, D. Y.(hello-lion@hotmail.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 3
Issue date: 2013
Publication year: 2013
Pages: 52-57
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Locally linear embedding (LLE) algorithm has a distinct deficiency in practical application. It requires users to select the neighborhood parameter, k, which denotes the number of nearest neighbors. A new adaptive method is presented based on supervised LLE in this article. A similarity measure is formed by utilizing the Fisher projection distance, and then it is used as a threshold to select k. Different samples will produce different k adaptively according to the density of the data distribution. The method is applied to classify plant leaves. The experimental results show

that the average classification rate of this new method is up to 92.4%, which is much better than the results from the traditional LLE and supervised LLE.
Number of references: 19
Main heading: Plants (botany)
Controlled terms: Agricultural engineering
Uncontrolled terms: Adaptive neighbors - Fisher projections - Leaf recognition - Manifold learning - Precision Agriculture - Supervised locally linear embedding
Classification code: 461.9 Biology - 821 Agricultural Equipment and Methods; Vegetation and Pest Control
DOI: 10.3965/j.ijabe.20130603.007
Database: Compendex

Data Provider: Engineering Village

40. Moisture dependent physical properties of Lagenaria siceraria seed

Accession number: 20140117167975
Authors: Said, Prashant Pandharinath (1); Pradhan, Rama Chandra (1)
Author affiliation: (1) Department of Farm Engineering, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh 221 005, India
Corresponding author: Said, P. P.(psaid4@gmail.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 111-120
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The investigation was done to evaluate the effect of moisture content on some physical properties of Lagenaria siceraria seed. The study was conducted at five moisture levels such as 8.84%, 10.10%, 11.89%, 12.60% and 15.10% (wet basis). Results showed that the mean value of principal dimensions, average diameters, surface area and 1000 seed mass increased linearly but aspect ratio decreased with increase in moisture content. The sphericity increased in the moisture range of 8.84% to 11.89% but decreased with further raise in the moisture up to 15.10%. Gravimetric properties like bulk density increased with increase in moisture content however true density and porosity decreased linearly with increase in moisture content. Angle of repose and terminal velocity increased linearly with moisture content of the seed. The coefficient of friction increased linearly with seed moisture content on five experimental surfaces (plywood, galvanized iron, glass and plastic). The information pertaining to moisture dependant physical properties of Lagenaria siceraria seeds may become an essential part in design of processing machines and its unit operations, design of dehulling, oil expression and other processing equipments.
Number of references: 52
Main heading: Moisture determination
Controlled terms: Aspect ratio - Moisture - Physical properties
Uncontrolled terms: Angle of repose - Coefficient of frictions - Gravimetric properties - Lagenaria siceraria - Principal dimensions - Processing equipment - Seed moisture contents - Sphericity
Classification code: 801.4 Physical Chemistry - 931.2 Physical Properties of Gases, Liquids and Solids - 943 Mechanical and Miscellaneous Measuring Instruments - 944.2 Moisture Measurements
DOI: 10.3965/j.ijabe.20130604.013
Database: Compendex

Data Provider: Engineering Village

41. Comparative proteomics analysis of tea leaves exposed to subzero temperature: Molecular mechanism of freeze injury

Accession number: 20140117167966
Authors: Hu, Yong Guang (1); Lu, Yong Zong (1); Lu, Jian (2)

Author affiliation: (1) Institute of Agricultural Engineering, Jiangsu University, Zhenjiang 212013, Jiangsu, China; (2) Institute of Life Sciences, Jiangsu University, Zhenjiang 212013, Jiangsu, China
Corresponding author: Lu, J.(lujian@ujs.edu.cn)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 27-34
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Tea freeze injury is one of the most severe agro-meteorological disasters, which leads to sizable losses of tea production in China. The freezing resistant ability of overwintering tea trees becomes weaker and weaker from early-spring to late-spring. If it decreases to critical temperature of -2 °C or lower in the stage with one or two leaves, tea trees suffer from freeze injury and the yield or quality of spring tea production could decrease greatly. Although measurements have been taken to prevent such damage, the physiological and biochemical mechanism of how tea (Camellia Sinensis) plant response to freeze injury is still to be elucidated. A comparative proteomics analysis was made on tea leaves at the two-leaf stage. The differential image analysis showed 46 spots with density changes (29 spots increased and 17 spots decreased; $p<0.01$) in the freeze injury group compared with the control group. Thirty eight differential protein spots ($p<0.01$) with good resolution and relatively high abundance in MS were subjected to further protein identification. Among them, all 17 up-regulated spots were collected whereas only six of the down-regulated spots were selected. These differentially expressed proteins including heat shock protein 70, oxygen-evolving enhancer protein, adenosine triphosphate synthase, S-adenosylmethionine synthetase and some enzymes involved in carbohydrate metabolism, were shown responsive to freeze injury. The results would greatly increase the comprehension of the molecular mechanism for freeze injury and provide a better decision making for freeze protection and control.
Number of references: 26
Main heading: Proteins
Controlled terms: Adenosinetriphosphate - Forestry - Mass spectrometry - Molecular biology - Physiological models - Plants (botany)
Uncontrolled terms: Camellia sinensis - Comparative proteomics - Freeze protection - Freeze-injury - Molecular mechanism
Classification code: 461.1 Biomedical Engineering - 461.9 Biology - 801 Chemistry - 804.1 Organic Compounds - 821.0 Woodlands and Forestry
DOI: 10.3965/j.ijabe.20130604.004
Database: Compendex

Data Provider: Engineering Village

42. Mathematical modeling on drying of Syzygium Cumini (L.)

Accession number: 20140117167973
Authors: Kalaivani, K. (1); Chitra Devi, V. (1)
Author affiliation: (1) Department of Chemical Engineering, Kongu Engineering College, Perundurai, Erode-638052, TN, India
Corresponding author: Chitra Devi, V.(erchitrasuresh@gmail.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 96-103
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)

Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: In this study, drying characteristics of Syzygium cumini was experimentally investigated under the temperatures of 50°C, 60°C and 70°C and the mathematical models were used to fit the drying of Syzygium cumini. Moisture transfered from Syzygium cumini was described by applying the Fick's diffusion model and the effective moisture diffusivity was calculated. The temperature dependence of the effective moisture diffusivity for the drying of Syzygium cumini samples was described by an Arrhenius-type relationship with activation energy. Drying data were fitted to seven drying models, namely Lewis, Henderson and Pabis, Logarithmic, Twoterm, Page, Wang and Singh and modified Henderson and Pabis. The Logarithmic model was found as the best fitted model in describing the drying behavior of Syzygium cumini.
Number of references: 37
Main heading: Drying
Controlled terms: Activation energy - Mathematical models
Uncontrolled terms: Drying behavior - Drying characteristics - Drying model - Effective moisture diffusivity - Fick's diffusion model - Logarithmic models - Syzygium cumini - Temperature dependence
Classification code: 642.1 Process Heating - 801.4 Physical Chemistry - 921 Mathematics
DOI: 10.3965/j.ijabe.20130604.011
Database: Compendex

Data Provider: Engineering Village

43. Evaluation and modification of potential evapotranspiration methods in Beijing, China

Accession number: 20140117167964
Authors: Liu, Hai Jun (1, 2); Li, Yan (1, 3); Zhang, Rui Hao (1); Huang, Guan Hua (3)
Author affiliation: (1) College of Water Sciences, Beijing Normal University, Beijing 100875, China; (2) State Key Laboratory of Simulation and Regulation of Water Cycle in River Basin, China Institute of Water Resources and Hydropower Research, Beijing 100048, China; (3) College of Water Resources and Civil Engineering, China Agricultural University, Beijing 100083, China
Corresponding author: Liu, H. J.(shanxilhj@bnu.edu.cn)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 9-18
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: In this study, seven widely used potential evapotranspiration (ETo) methods were evaluated by comparing with the FAO-56 Penman-Monteith method (PM method) to provide useful information for selecting appropriate ETo equations under data-limited condition in Beijing, China. Statistical methods and parameters, namely linear regression, root mean squared error (RMSE) and mean bias error (MBE), were used to evaluate the seven ETo methods. Results showed that ETo estimated using Kimberly-Penman method have fairly close agreement with the PM method (referring to standard ETo), considering the coefficient of determination (R2) of 0.96, RMSE of 0.42 mm/day, and a coefficient of efficiency (E) of 0.96. Locally calibrated Penman and Doorenbos-Pruitt methods also have better agreement with the PM method, correspondingly with R2 of 0.99 and 0.95, RMSEs of 0.24 mm/day and 0.21 mm/day, and coefficients of efficiency of 1.02 and 0.99, respectively. The ETo is the most sensitive to vapor pressure deficit (VPD) and net radiation in the Beijing area. Hence, the VPD-based and VPD-radiation combined ETo methods were developed and calibrated. Results showed that the two developed methods performed well in ETo estimation. By fully considering the data-limit situation, the calibrated Turc method, VPD-based method and VPD-radiation-combined method may be attractive alternatives to the more complex Penman-Monteith method in Beijing.
Number of references: 45
Main heading: Evapotranspiration
Controlled terms: Efficiency
Uncontrolled terms: Beijing - Coefficient of efficiencies - Determination coefficients - Penman-Monteith method - Potential evapotranspiration
Classification code: 444.1 Surface Water - 913.1 Production Engineering
DOI: 10.3965/j.ijabe.20130604.002

Database: Compendex

Data Provider: Engineering Village

44. Storage stability of dried tomato slice

Accession number: 20140117167974
Authors: Shittu, S.K. (1); Isiaka, M. (2)
Author affiliation: (1) Department of Agricultural Engineering, Bayero University, Kano, Nigeria; (2) Department of Agricultural Engineering, Ahmadu Bello University, Zaria, Nigeria
Corresponding author: Shittu, S. K.(sarafadeenshittu@yahoo.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 104-110
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Unlike fresh farm produce, processed fruits and vegetables such as sun dried tomatoes can be categorized as ambient temperature shelf stable products. However, large quantities of these products yet easily go bad most especially when the appropriate conditions for their storage are not offered. To minimize these losses, it is important to know and exploit the optimum environmental conditions and moisture content range for the storage of the products. The present study through systematic theoretical assertions employed by other researchers on other crops seeks to establish the storage stability of dried tomato slice at three probable temperatures of 10, 30 and 45°C. Results show that in this temperature range, upper limit moisture content varied between 6%-7.5% and 6.5%-8.3% d.b. for adsorption and desorption, respectively. The corresponding lower limit moisture contents varied between 4.29%-5.52% and 5.15%-6.29% d.b. In order to minimize moisture migration into or out of dried tomato slice during storage, the study revealed that the product should be stored within 29%-62% relative humidity.
Number of references: 20
Main heading: Thermal processing (foods)
Controlled terms: Atmospheric humidity - Fruits - Moisture - Moisture determination - Temperature
Uncontrolled terms: Adsorption and desorptions - Dried tomato - Environmental conditions - Fruits and vegetables - Moisture migration - Storage stability - Temperature range - Tomato slices
Classification code: 443.1 Atmospheric Properties - 641.1 Thermodynamics - 821.4 Agricultural Products - 822.2 Food Processing Operations - 944.2 Moisture Measurements
DOI: 10.3965/j.ijabe.20130604.012
Database: Compendex

Data Provider: Engineering Village

45. Effects of surface texturing on microalgal cell attachment to solid carriers

Accession number: 20140117167968
Authors: Cui, Yan (1); Yuan, Wen Qiao (1); Cao, Jian (2)
Author affiliation: (1) Department of Biological and Agricultural Engineering, North Carolina State University, Raleigh, NC 27695-7625, United States; (2) Department of Mechanical Engineering, Northwestern University, Evanston, IL 60208-3109, United States
Corresponding author: Yuan, W. Q.(wyuan2@ncsu.edu)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 44-54
Language: English

ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The objective of this study was to understand the role of surface texturing in microalgal cell attachment to solid surfaces. Two microalgal species, Scenedesmus dimorphus and Nannochloropsis oculata, were studied on solid carriers made of nylon and polycarbonate. Ridge, pillar and groove at micro-scale were engineered on the solid carriers. Cell response to the textured surfaces was separately described by the Cassie and Wenzel models and the contact point theory. Comparison between measured and model-predicted contact angles indicated that the wetting behavior of the textured solid carriers fell into the Wenzel state, which implied that algal cells could fully penetrate into the designed textures, but the adhesion behavior would be dependent on the size and shape of the cell. Experimental results showed that the attachment was preferred when the feature size was close to the diameter of the cell attempting to settle. Larger or smaller feature dimensions had the potential to reduce cellular attachment. The observation was found to qualitatively comply with the contact point theory.
Number of references: 47
Main heading: Cytology
Controlled terms: Cells - End effectors - Textures
Uncontrolled terms: Adhesion behaviors - Algal biofuels - Cellular attachments - Contact points - Feature dimensions - Nannochloropsis oculata - Surface textures - Wenzel models
Classification code: 461.2 Biological Materials and Tissue Engineering - 731.5 Robotics - 933 Solid State Physics
DOI: 10.3965/j.ijabe.20130604.006
Database: Compendex

Data Provider: Engineering Village

46. Ecohydrologic modeling of crop evapotranspiration in wheat (Triticum-aestivum) at sub-temperate and sub-humid region of India

Accession number: 20140117167965
Authors: Kumar, Rohitashw (1)
Author affiliation: (1) Division of Agricultural Engineering, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Shalimar Campus, Srinagar 190025, India
Corresponding author: Kumar, R.(rohituhf@rediffmail.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 19-26
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Efficient water management of crop requires accurate irrigation scheduling which, in turn, requires the accurate measurement of crop water requirement. Reference evapotranspiration plays an important role for the determination of water requirements for crops and irrigation scheduling. Various models/approaches varying from empirical to physically base distributed are available for the estimation of reference evapotranspiration. This study identified most suitable reference evapotranspiration model for sub-temperate, sub humid agro-climatic condition using climatic and lysimeter data. The Food and Agriculture Organization (FAO) recommended crop coefficient values are modified for the local agro-climatic conditions. The field experiment was conducted in sub-temperate and sub-humid agro-climate of Solan, Himachal Pradesh, India. Actual crop evapotranspiration for different crop growth stages of wheat (Triticum-aestivum) has been obtained from water balance studies using lysimeter set-up. Field observed and computed individual-stage wise crop evapotranspiration values are compared, to identify the most suitable reference evapotranspiration model for computing crop evapotranspiration. Penman Monteith model shows close agreement with observed value with COD, SEE and ARE values; 0.96, 13.69 and -5.8, respectively. Further, an effort has been made to compare the accuracy of various widely used methods under different climatic conditions.
Number of references: 25
Main heading: Crops

Controlled terms: Evapotranspiration - Irrigation - Lysimeters - Scheduling - Soil surveys - Water conservation
Uncontrolled terms: Crop coefficient - Crop evapotranspiration - Crop water requirements - Food and agriculture organizations - Himachal Pradesh , India - Irrigation scheduling - Penman-Monteith models - Reference evapotranspiration
Classification code: 912.2 Management - 821.4 Agricultural Products - 821.3 Agricultural Methods - 631.1 Fluid Flow, General - 444.1 Surface Water - 444 Water Resources - 406.2 Roads and Streets
DOI: 10.3965/j.ijabe.20130604.003
Database: Compendex

Data Provider: Engineering Village

47. Nutrients and anti-nutrients of high chlorophyll - Mungbean sprouts as affected by different periods of germination and sprouting stages

Accession number: 20140117167976
Authors: Vayupharp, Benjaruk (1); Laksanalamai, Varaporn (1)
Author affiliation: (1) Rangsit University, Muang-AkePhatumthani 12000, Thailand
Corresponding author: Laksanalamai, V.(varaporn@rsu.ac.th)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 121-129
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The variation of nutrient and anti-nutrient compounds in commercial mungbean cultivars (Chinat 72, MS-1, Chinat 80, and L3-8) during seven periods of germination and sprouting was determined. The seeds were selected randomly at 6 h of soaking (1st stage), 23 h (2nd stage), 47 h (3rd stage), 71 h (4th stage), 77 h (5th stage) of sprouting, and 12 h, and 24 h of sunshine exposing (6th and 7th stage, respectively). It was found that nutrition compositions (including protein content, crude fiber content, vitamin C content, total minerals, and HCL-extractability of minerals) of all cultivars significantly increased with germination and sprouting. At the last stage, the total phenol was the highest amount which was not significantly different from all cultivars. The total antiradical capacity (%, DPPH inhibition) increased up to the maximum value in the last two stages of sprouting. The results showed that the phytic acid, the anti-nutrient component decreased with the consequence of germination, and reached the untraceable value at the last stage. In addition, the highest amount of chlorophyll (7.15- 8.99 mg/100 g) was found in Chinat 72 and MS-1 cultivars at the last stage of sprouting, comparing to Chinat 80 and L3-8 cultivars. It is therefore recommended to consume high chlorophyll mungbean sprout with the benefits of high nutrient constituents and low price purchase comparing to other green vegetables.
Number of references: 30
Main heading: Nutrients
Controlled terms: Chlorophyll - Cultivation - Minerals
Uncontrolled terms: Hcl extractability - Mungbeans - Phytic acids - Radical scavenging activity - Total phenolic content
Classification code: 482.2 Minerals - 804.1 Organic Compounds - 821.2 Agricultural Chemicals - 821.3 Agricultural Methods
DOI: 10.3965/j.ijabe.20130604.014
Database: Compendex

Data Provider: Engineering Village

48. Microwave-low-pressure process (MWLP) - An effective technology applied in extraction of total polyphenols

Accession number: 20140117167972
Authors: Hu, Zhong Qiu (1); Jia, Li Li (1); Yue, Tian Li (1)

Author affiliation: (1) College of Food Science and Engineering, Northwest A and F University, Yangling 712100, Shaanxi, China
Corresponding author: Yue, T. L.(yuetl305@nwsuaf.edu.cn)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 84-95
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The microwave-low-pressure process (MWLP) of total polyphenols from Chaenomeles speciosa fruit was studied, and the advantages of MWLP were further evaluated by comparing with ultra high pressure (UHP) and microwave-assisted extraction (MAE). The influences of liquid/solid ratio, extraction time, pressure, and ethanol concentration on the performance of MWLP were investigated. Thereafter, the interactive variables were further optimized by the stepwise multiple quadratic regression model on the basis of the previous univariate analysis. The results showed that temperature as an intermediate variable in MWLP significantly affected the yields of polyphenols and 3-o-caffeoyl-quinic acid, which was determined by pressure and ethanol concentration. The optimized parameters were proved to be valid because the results predicted by the stepwise multiple quadratic regression model equations fit well with the experimental results. Compared with UHP, the predominance of MWLP was that the extraction time was shortened and the cost of extraction equipment was lowered. MWLP is an effective technology since MWLP was superior to MAE based on extraction yield, solvent loss and reproducibility.
Number of references: 35
Main heading: Extraction
Controlled terms: Ethanol - Fruits - Mathematical models - Optimization - Regression analysis
Uncontrolled terms: Ethanol concentrations - Extraction equipment - Microwave-assisted extraction - Microwave-low-pressure process (MWLP) - Model optimization - Performance evaluation - Total polyphenols - Ultra high pressure (UHP)
Classification code: 523 Liquid Fuels - 802.3 Chemical Operations - 821.4 Agricultural Products - 921 Mathematics - 921.5 Optimization Techniques - 922.2 Mathematical Statistics
DOI: 10.3965/j.ijabe.20130604.010
Database: Compendex

Data Provider: Engineering Village

49. Spatial distribution visualization of PWM continuous variable-rate spray

Accession number: 20140117167963
Authors: Deng, Wei (1); Huang, Yan Bo (2); Zhao, Chun Jiang (1); Wang, Xiu (1); Liu, Jing Long (3)
Author affiliation: (1) Beijing Research Center of Intelligent Equipment for Agriculture, Beijing Academy of Agriculture and forestry Science, Beijing 100097, China; (2) United States Department of Agriculture, Agricultural Research Service, Crop Production Systems Research Unit, Stoneville, MI, United States; (3) Baoding Radio and TV University, Baoding 071000, China
Corresponding author: Deng, W.(dengw@nercita.org.cn)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 1-8
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China

Abstract: Pesticide application is a dynamic spatial distribution process, in which spray liquid should be able to cover the targets with desired thickness and uniformity. Therefore, it is important to study the 2-D and 3-D (dimensional) spray distribution to evaluate spraying quality. The curve-surface generation methods in Excel were used to establish 1-D, 2-D, and 3-D graphics of variable-rate spray distribution in order to characterize the space distribution of the variable-rate spray. The 1-D, 2-D, and 3-D distribution graphs of Pulse-Width Modulation (PWM)-based continuous variable-rate spray were developed to provide a tool to analyze the distribution characteristics of the spray. The 1-D graph showed that the spray distribution concentrated toward the center of the spray field with the decreased flow-rate. The 2-D graph showed that the spray distribution always spread as the shape of Normal Probability Distribution with the change of the flow-rate. The 3-D graph showed that the spray distribution tended to be uniform when the sprayer travelled forward at the appropriate speed. This study indicated that the visualization method could be directly used for analysis and comparison of different variable-rate spray distributions from different experimental conditions and measuring methods.
Number of references: 17
Main heading: Pulse width modulation
Controlled terms: Flow graphs - Modulation - Probability distributions - Quality control - Spatial distribution - Two dimensional - Visualization - Voltage control
Uncontrolled terms: Distribution characteristics - Distribution process - Experimental conditions - Normal probability distributions - Pesticide applications - Spray distribution - Variable rate - Visualization method
Classification code: 716 Telecommunication; Radar, Radio and Television - 731.3 Specific Variables Control - 902.1 Engineering Graphics - 913.3 Quality Assurance and Control - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 922.1 Probability Theory
DOI: 10.3965/j.ijabe.20130604.001
Database: Compendex

Data Provider: Engineering Village

50. New method of solar energy application in greenhouses to decrease fuel consumption

Accession number: 20140117167970
Authors: Farzaneh-Gord, Mahmood (1); Arabkoohsar, Ahmad (2); Bayaz, Mahdi Deymi Dashte (3); Khoshnevis, Abdolamir Bak (3)
Author affiliation: (1) Shahrood University of Technology, Shahrood, Iran; (2) Department of Mechanical Engineering, Minoodasht Branch, Islamic Azad University, Minoodasht, Iran; (3) Hakim Sabzevari University, Sabzevar, Iran
Corresponding author: Arabkoohsar, A.(Mani.koohsar@yahoo.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 64-75
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Renewable energies (especially solar energy) are globally suitable alternatives for fossil fuels. On the other hand, greenhouses, as a main part of agriculture industry, use a significant amount of fossil fuels annually to provide the required heat for the under-cultivation crops in the greenhouse. Currently this heat demand is provided by a heater which burns gas oil as its main fuel. The main problem with these heaters is fuel hyper-consumption. That is why feasibility of utilizing a solar energy storage system in greenhouses is studied here. As the low temperature heat is required for preheating the air in the greenhouse, a solar collector array is proposed to be utilized in order to displace heating demand of the heater and to reduce amount of fuel consumption. To evaluate the proposed system effectiveness, an economic survey has been done on the proposed system based on Net Present Value (NPV) method. The optimum capital cost for the project is found based on economic methods. The economic analysis shows that 85 flat plate collector modules and an 8.5 cubic meters of storage tank are optimum selection of the project. The results showed that, by employing the proposed system, 7 735 USD benefit as well as 11 050 litres of fuel providence is obtainable annually. Economic evaluation based on NPV method resulted in the payback period of ten years.
Number of references: 51
Main heading: Economic analysis

Controlled terms: Cultivation - Fossil fuels - Fuels - Greenhouses - Investments - Solar energy - Tanks (containers) - Thermal stratification
Uncontrolled terms: Agriculture industries - Economic evaluations - Flat-plate collector - NPV - Renewable energies - Solar energy applications - Storage tank - System effectiveness
Classification code: 911.2 Industrial Economics - 821.6 Farm Buildings and Other Structures - 821.3 Agricultural Methods - 619.2 Tanks - 615.2 Solar Power - 524 Solid Fuels - 523 Liquid Fuels - 522 Gas Fuels - 443.1 Atmospheric Properties
DOI: 10.3965/j.ijabe.20130604.008
Database: Compendex

Data Provider: Engineering Village

51. Biomass energy cost and feasibility of gasifier based biomass power generation system

Accession number: 20140117167969
Authors: Khambalkar, Vivek Prakash (1); Kankal, Udhav S. (1); Karale, D.S. (1); Gangde, C.N. (1)
Author affiliation: (1) Department of Farm Power and Machinery, College of Agricultural Engineering and Technology, Dr. Panjabrao Deshmukh Agricultural University, Akola MS 444 104, India
Corresponding author: Khambalkar, V. P.(vivek_khambalkar@hotmail.com)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 55-63
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The present research work has been carried out on biomass based 10 kW capacity gasifier power generation system installed at College of Agricultural Engineering and Technology, Dr. Panjabrao Deshmukh Agricultural University (Dr. PDKV), Akola Maharashtra, India. The main objectives were to evaluate various costs and benefits involved in the power generation system. The costs of energy per unit were calculated for the first year of operation. The economics of gasifier based power generation system and thereby the feasibility of the system was examined by estimating per unit cost, Net Present Value (NPV), Benefit Cost Ratio (BCR), Internal Rate of Return (IRR) and payback period. The discount cash flow method was used to find out the IRR. In the present analysis, three costs viz. installed capital cost, operation and maintenance cost, and levelised replacement cost were examined for the evaluation of the power generation per unit. Discount rate on investment in case of subsidy (Case I) and in case without subsidy (Case II) for installation cost of system was considered as 12.75%. The BCR comes in Case I for operating duration of 22 h, 20 h, and 16 h are 1.24, 1.18, and 1.13 respectively. Similarly for Case II BCR comes 1.44, 1.38, and 2.39. The IRR comes in Case I for operating duration of 22 h, 20 h, and 16 h are 26%, 22%, and 19% respectively. Similarly for Case II IRR comes 52%, 44%, and 39% for operating duration of 22 h, 20 h, and 16 h, respectively. The payback period in the present analysis was worked out. The payback period for biomass based gasifier power generation system were observed to be for Case I from three to four years and for Case II it was one to two years.
Number of references: 31
Main heading: Cost benefit analysis
Controlled terms: Biomass - Costs - Earnings - Economics - Investments
Uncontrolled terms: Benefit cost ratios - Cost of energies - Discounted cash flow - Internal rate of return - Net present value - Payback periods
Classification code: 525.1 Energy Resources and Renewable Energy Issues - 911 Cost and Value Engineering; Industrial Economics - 911.2 Industrial Economics
DOI: 10.3965/j.ijabe.20130604.007
Database: Compendex

Data Provider: Engineering Village

52. Pre-harvest and post-harvest application of benzothiadiazole for controlling anthracnose and extending shelf life of harvested banana

Accession number: 20140117167971
Authors: Li, Xue Ping (1); Shi, Jing Ying (2); Zhu, Xiao Yang (1); Wang, Jing Hua (1); Yuan, Zhen Xin (1); Luo, Jun (1); Liu, Tong Xin (1); Wang, Rong (1); Rao, Shen (1); Chen, Wei Xin (1)
Author affiliation: (1) State Key Laboratory for Conservation and Utilization of Subtropical Agro-bioresources, Guangdong Provincial Key Laboratory for Postharvest Science and Technology of Fruits and Vegetables, College of Horticulture, South China Agricultural University, Guangzhou 510642, China; (2) College of Food Science and Engineering, Shandong Agricultural University, Taian 271018, China
Corresponding author: Chen, W. X.(wxchen@scau.edu.cn)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 76-83
Language: English
ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: Anthracnose, caused by the fungus Colletotrichum musae, is a serious latent post-harvest disease of banana, which results in major economic losses during transportation and storage. Benzo-thiadiazole-7-carbothioic acid S-methyl ester (BTH), a functional analogue of the plant endogenous hormone-like compound salicylic acid (SA), has been known to possess resistant effects on some diseases caused by fungi. The aim of present study was to select an appropriate BTH concentration and an appropriate stage of banana ripening for its application in controlling anthracnose and extending shelf life of harvested banana fruit. Different concentrations of BTH (50, 100, 200 and 300 μg/mL) were applied at different stages of banana fruit ripening, including one week, two weeks and one month before harvest. The results suggest that while the concentrations of BTH ranging from 50 μg/mL to 200 μg/mL in both pre-harvest and post-harvest application could control anthracnose of harvested banana fruit, the appropriate concentration of BTH in both pre-harvest and post-harvest treatment was 100 μg/mL and the best time of BTH treatment was two weeks before harvest. Examination of quality parameters including peel color and firmness indicated that 100 μg/mL BTH treatment delayed banana fruit ripening at room temperature.
Number of references: 22
Main heading: Harvesting
Controlled terms: Fruits - Losses
Uncontrolled terms: Anthracnose - Banana fruits - BTH treatment - Firmness - Postharvest - Ripening - Shelf life
Classification code: 821.3 Agricultural Methods - 821.4 Agricultural Products - 911.2 Industrial Economics
DOI: 10.3965/j.ijabe.20130604.009
Database: Compendex

Data Provider: Engineering Village

53. Distribution of heavy metals in pig farm biogas residues and the safety and feasibility assessment of fertilization

Accession number: 20140117167967
Authors: Ma, Jieqiong (1); Zhu, Hongguang (1); Fan, Min (1)
Author affiliation: (1) Research Institute of Modern Agricultural Science and Engineering, Biomass Energy Research Center, Tongji University, Shanghai 200092, China
Corresponding author: Zhu, H.(zhuhg@tongji.edu.cn)
Source title: International Journal of Agricultural and Biological Engineering
Abbreviated source title: Int. J. Agric. Biol. Eng.
Volume: 6
Issue: 4
Issue date: 2013
Publication year: 2013
Pages: 35-43
Language: English

ISSN: 19346344
E-ISSN: 19346352
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering, Agricultural Exhibition Road South, Beijing, 100026, China
Abstract: The presence of high levels of heavy metals in anaerobic fermentation residues is a major obstacle to the resource utilization and urgent research for removal of heavy metals in the biogas slurry is needed. The handling of large-scale residue slurry and safely returning to field urgently needed constructive suggestion. The contents of heavy metal elements in the residue of anaerobic digestion processes of the wastewater and waste of the piggery were mainly investigated. The contents of heavy metals in the original fluid and the centrifugal solution were determined in this study. They included elements, such as Cu, Zn, Cr, Cd, Pb, As, Ni, Mn, Se, which were compared with the existing standard including the irrigation water quality standards (GB5084-2005), comprehensive discharge standard of sewage (GB8978-1996) and water-solubility humic acid fertilizer quality standards (NY1106-2010). The preliminary data suggested that both the heavy metals before and after centrifugation were in excess of the standards to some degree and the exceeding standard rate declined significantly after centrifugation. The absolute contents of heavy metals after centrifugation declined significantly compared with that before centrifugation. Those ratios are 91.8%, 73.2%, 47.6%, 94.5%, 93.5%, 59.4%, 95.8%, 100% for Zn, As, Cd, Cr, Cu, Ni, Mn, Pb, respectively. A descriptive statistics as well as a correlational analysis showed that there existed strong correlation among Cu, Pb, and the TS. Meanwhile, significant correlation was found among total suspended solids (TS), Cd, Zn, As, Cr, Ni, and Mn at 0.01 level. The data and the analysis above provided the theoretical and experimental support for the removal of heavy mental mainly characterized by the removal of TS. According to the comparison between contents of heavy mental conversed from large amount nutrients and corresponding standard (NY1110-2006), only As was found beyond standard. It was feasible to apply biogas residues after centrifugation as water-solubility fertilizer due to the fact that As had low accumulation efficiency in soil and plants.
Number of references: 31
Main heading: Centrifugation
Controlled terms: Biogas - Correlation methods - Fertilizers - Heavy metals - Irrigation - Lead - Manganese - Manganese removal (water treatment) - Nickel - Sewage - Solubility - Water quality - Zinc
Uncontrolled terms: Anaerobic digestion process - Anaerobic fermentation residues - Biogas residues - Distribution - Feasibility assessment - Fertilization - Irrigation water quality - Total suspended solids
Classification code: 922.2 Mathematical Statistics - 546.3 Zinc and Alloys - 548.1 Nickel - 801.4 Physical Chemistry - 802.3 Chemical Operations - 804 Chemical Products Generally - 821.3 Agricultural Methods - 546.1 Lead and Alloys - 531 Metallurgy and Metallography - 522 Gas Fuels - 452.1 Sewage - 445.2 Water Analysis - 445.1 Water Treatment Techniques - 543.2 Manganese and Alloys
DOI: 10.3965/j.ijabe.20130604.005
Database: Compendex

Data Provider: Engineering Village