



**ASSOCIATION FOR THE ADVANCEMENT  
OF INDUSTRIAL CROPS**

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“Integrating technology with industrial crops and their  
products for a sustainable bioeconomy”

33<sup>rd</sup> Annual Meeting

October 9-12, 2022

Best Western Plus GranTree Inn

Bozeman, MT USA

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Oilseeds:	Hussein Abdel-Haleem, USDA-ARS ALARC, Maricopa, AZ, USA

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# Conference Program

## Sunday, October 09

8:00 AM - 5.00 PM	<b>Tour- Yellowstone National Park</b>
7.00 AM	Board bus – Hotel entrance
7.30 AM	Bus departs
12.30 PM	Lunch
5.00 PM	Arrive hotel

5:30 - 6:30 PM	AAIC Board Meeting	Board Room
5:30 - 6:30 PM	Registration	
6:30 - 9:00 PM	Opening Reception	

## Monday, October 10

### Plenary Session (Keynote Talks)

**Moderator: Dilpreet Bajwa**

**Room: Hyalite**

8:00-10:00 AM	Registration Desk Open and Poster set up	
8:00 AM	<u>Dilpreet Bajwa</u> , Montana State University, Bozeman, MT, USA	Introduction
8:05 AM	<u>Alison Harmon</u> , Interim Vice President of Research and Economic Development, Montana State University, Bozeman, MT, USA	Welcome address
8:15 -8:45 AM	<u>Cort Jensen</u> , Montana Department of Agriculture, Helena, MT, USA	What one needs to know about growing energy and industrial crops
8:45-9:15 AM	<u>Ron Colwell</u> , Montana Renewables, Calumet, Great Falls, MT, USA	Montana Renewables: Pioneering seed to diesel
9:15-9:45 AM	<u>Keith Horton</u> , Sustainable Oils, Great Falls, MT, USA	Camelina: From farms to energy
<b>9:45-10:00 AM</b>	<b>Coffee Break</b>	
10:00-10:30 AM	<u>Andrew Bishop</u> , Ag Processing Solutions, Great Falls, MT, USA	Farming on dryland and value-added commodity processing in North

		Central, Montana
10.30 - 11:00 AM	<u>Chaofu Lu</u> , Montana State University, Bozeman, MT, USA	Developing camelina oilseed for sustainable production of biofuels and oleochemicals
11.00 - 11.30 AM	<u>Marisol Berti</u> , North Dakota State University, Fargo, ND, USA	Life cycle assessment and ecosystem services delivery of cropping systems that include industrial crops

## Boxed Lunch 12.15 pm

### TECHNICAL SESSIONS Concurrent Sessions

#### 1. Fiber & Cellulosic Crops

**Moderator: Efthymia Alexopoulou**

**Room: Hyalite**

2:00 PM	<b>Keynote speaker:</b> Dilpreet S. Bajwa	NATURAL FIBER- GROWTH, TRENDS AND FUTURE
2:30 PM	<u>Burton L. Johnson</u> , Darin J. Eisinger, and Mark E. Zarnstorff	STEM INJURY EFFECTS ON INDUSTRIAL HEMP GRAIN AND BIOMASS YIELD IN NORTH DAKOTA
2.50 PM	<u>Saptarni Chanda</u> , Dilpreet S Bajwa, Nicole Stark, and Sreekala G. Bajwa	NANO BORON OXIDE AND NANO ZINC OXIDE INCORPORATION TO CELLULOSE NANOCRYSTALS TO IMPROVE THE THERMAL, MECHANICAL AND FLAMMABILITY PROPERTIES OF HIGH-DENSITY POLYETHYLENE POLYMER
3:10 PM	<b>Coffee Break</b>	
3:30 PM	<u>Efthymia Alexopoulou</u> , K. Iordanoglou, D. Kotoula, G. Tsipas, and E.G. Papazoglou	HOW IRRIGATION AND FERTILIZATION AFFECTS GROWTH AND YIELDS OF INDUSTRIAL HEMP GROWTH ON A MARGINAL AGRICULTURAL LAND IN GREECE
3:50 PM	<u>Moritz Von Cossel</u> , and Jablonowski, N.D.	ENERGY YIELD DECLINE OF SIDA ( <i>SIDA HERMAPHRODITA</i> L. RUSBY) IN A

		SUMMER HARVEST REGIME FOR BIOGAS PRODUCTION
4:10 PM	<u>Andrew Durado</u> , and D.S. Bajwa	BIODEGRADABLE COMPOSITE HYDROMULCHES FOR SUSTAINABLE ORGANIC HORTICULTURE
4:30 PM	<u>Michele Pastore</u> , João Pires, Leandro Gomes, Victor Gomes Lauriano Souza, Walter Zegada Lizarazu, Andrea Monti, and Ana Luisa Fernando	ENHANCING THE VALUE OF LIGNOCELLULOSIC BIOMASSES THROUGH THE PRODUCTION OF BIONANOCOMPOSITES
4:50-5:20 PM	<b>Fiber and Cellulosics Division Meeting- Division Chair: Efthymia Alexopoulou</b>	
5:00-6:00 PM	<b>Poster Session</b>	

## 2. Medicinal & Nutraceutical Plants

**Moderator: Diana Jasso De Rodríguez**

**Room: Lewis and Clark**

2:00 PM	<i>Keynote Speaker:</i> <u>Ralph M. Paroli</u> and R.J. Morgan	DEVELOPING NORMATIVE STANDARDS FOR THE CANNABIS/HEMP SECTOR
2.30 PM	<u>Nirmal Joshee</u> , Brajesh N Vaidya, and Samantha H Sherman	REPRODUCTIVE BIOLOGY OF MEDICINAL TREE, <i>PAULOWNIA</i> : POLLEN-STIGMA INTERACTION, EXTRAFLORAL NECTARIES AND TRICHOMES
2:50 PM	<u>Diana Jasso de Rodríguez</u> !, Martín F. Rocha-Rivera, Homero Ramírez-Rodríguez, Raúl Rodríguez García, José A. Villarreal-Quintanilla, and Lourdes Díaz-Jiménez	SEMI-DESERT PLANT EXTRACTS AS BIOSTIMULANTS FOR GROWTH, YIELD AND FRUIT QUALITY IN BELL PEPPER ( <i>Capsicum annuum</i> L.)

<b>3:10-3:30 PM</b>	<b>Coffee Break</b>
<b>3:30-4:00 PM</b>	<b>Medicinal and Nutraceuticals Plants Division Meeting Division Chair: Diana Jasso de Rodriguez</b>
<b>4:00-5:00 PM</b>	<b>Poster Session</b>

**Dinner on Your Own**

# Tuesday, October 11

## TECHNICAL SESSIONS Concurrent Sessions

### 3. General Crops & Products

**Moderator: Ana Luisa Fernando**

**Room: Lewis and Clark**

8:00 AM	<i>Keynote Speaker:</i> <u>Efthymia Alexopoulou</u>	THE MAGIC PROJECT MARGINAL LANDS FOR GROWING INDUSTRIAL CROPS: TURNING A BURDEN INTO AN OPPORTUNITY
8:30 AM	<u>Liv S. Severino</u>	EXPLORING PLANT'S COGNITIVE ABILITIES AS A TOOL FOR MANAGEMENT OF INDUSTRIAL CROPS
8:50 AM	<u>Ana Luisa Fernando</u> , M.P. Duarte, M. Gonçalves, and E. Alexopoulou	OUT OF THE BOX: COMBATING CLIMATE CHANGE WITH PHYTOREMEDIATION. IS IT POSSIBLE?
9:10 AM	<u>Alan Taylor</u> , Y. Jiang, M. Amirkhani, E. Lewis, and L. Sosnoskie	IMAGING OF FLUORESCENT, SYSTEMIC SEED TREATMENT TRACERS IN HEMP FOR THE DEVELOPMENT OF A WEED MANAGEMENT SYTEM
9:30 AM	<u>Emily Makowski</u> , S. Kane, and C. Ryan	BIODEGRADABLE 3D-PRINTED RFID SENSOR FOR AGRICULTURAL PURPOSES
<b>9:50 AM</b>	<b>Coffee Break</b>	
10:10 AM	<u>Steve F. Vaughn</u> , S.X. Liu, M.A. Berhow, J.K. Winkler-Moser, S.C. Peterson, G.W. Selling, W.T. Hay, and C.D. Skory.	PRODUCTION OF AN ODOR- REDUCING, ANTIBACTERIAL CLUMPING CAT LITTER FROM SOYBEAN HULLS AND SOYBEAN HULL BIOCHAR

10:30-11:00 AM	<b>General Crops Division Meeting – Division Chair: Ana Luisa Fernando</b>	
11:00-12:00 PM	<b>Poster Session</b>	

## TECHNICAL SESSIONS Concurrent Sessions

### 4. Oilseeds (Tuesday, Oct 11)

**Moderator: Hussein Abdel-Haleem**

**Room: Hyalite**

8:00 AM	<b>Keynote Speaker:</b> <u>James V. Anderson</u> , Brant Bigger, Kirk Howatt, Joseph Mettler, and Marisol T. Berti	AGRONOMIC TRAITS AND ECOSYSTEM BENEFITS OF FIELD GROWN SULFONYLUREA-RESISTANT <i>CAMELINA SATIVA</i> AND <i>BRASSICA NAPUS</i>
8:30 AM	<u>Federica Zanetti</u> , Barbara Alberghini, Richard P. Haslam, Susana Silvestre, Sylvain Prigent, Jean-Denis Faure, Anais Da Costa, Javier Prieto, Yuri Herrerias Yambanis, Andrea Monti, Yves Gibon, Dominik K. Grosskinsky, Bjorn Usadel, and Claudia Jonak	UNCOVERING MORPHO PHYSIOLOGICAL DIVERSITY IN <i>CAMELINA</i> ( <i>CAMELINA SATIVA</i> L. CRANTZ)
8:50 AM	<u>Barbara Alberghini</u> , Federica Zanetti, Walter Zegada-Lizarazu, Federico Ferioli, Angela Vecchi, and Andrea Monti	WATER STRESS EFFECT ON MORPHOLOGICAL AND COMPOSITIONAL CHARACTERISTICS OF TWO CONTRASTING <i>CAMELINA</i> BIOTYPES
9:10 AM	<u>Efthymia Alexopoulou</u> , F. Zanetti, K. Kempapidis, Y. Yambanis, and A. Monti	<i>CAMELINA</i> : A CASH COVER CROP FOR GREECE



9:30 AM	<u>Noemi Codina-Pascual</u> , C. Cantero-Martínez, M. P. Romero, and A. Royo-Esnal	YIELD AND OIL CHARACTERISTICS OF 10 CAMELINA VARIETIES AS AFFECTED BY SOWING DATE IN A MEDITERRANEAN CLIMATE
<b>9:50 AM</b>	<b>Coffee break</b>	
10:10 AM	<u>Chengci Chen</u> , Charlemagne Lim, Shreya Gautam, Sooyoung Franck, and Chaofu Lu	CAMELINA RESPONSE TO NITROGEN FERTILIZER INPUT AND IDENTIFICATION OF HIGH NITROGEN USE EFFICIENCY GENOTYPES
<b>10:30 AM-12:00 PM</b>	<b>Poster Session</b>	

### Lunch on Your Own

### TOUR – MUSEUM OF ROCKIES

1:30-6:00 PM	<b>Tour- Museum of Rockies &amp; Brewery Tour</b>
1:00 PM	Bus boards
1:30 PM	Bus departs
1:30-3:30 PM	Museum of Rockies
4:00-6:00 PM	Brewery Tour

# Wednesday, October 12

## TECHNICAL SESSIONS Concurrent Sessions

### 4. Oilseeds Division

**Moderator: Hussein Abdel-Haleem**

**Room: Hyalite**

8:00 AM	<u>Racheal N. Upton</u> , Fernando Henrique Correr, and Jennifer Lachowiec	DETERMINING <i>CAMELINA SATIVA</i> GERMINATION RATE VARIATION AND GENETIC CONTROL
8:20 AM	<u>Fernando Henrique Correr</u> , Racheal Upton, Anapaula Astorga, and Jennifer Lachowiec	OVEREXPRESSION OF <i>MIRNA167A</i> INCREASES GERMINATION RATES IN <i>CAMELINA SATIVA</i>
8:40 AM	<u>Ana Luisa Fernando, L. Gomes</u> , J. Moreira, B. Gomes, M. Abias, J. Costa, F. Zanetti, and A. Monti,	PROSPECTS OF OILSEED CROPS CULTIVATION IN HEAVY METAL CONTAMINATED SOILS - PRODUCING A RENEWABLE FEEDSTOCK USING ECOLOGICAL REMEDIATION
9:00 AM	<u>Winthrop B. Phippen</u> , John C. Sedbrook, and M. David Marks	ADVANCEMENTS IN BREEDING PENNYCRESS ( <i>Thlaspi arvense</i> L.) AS A SUSTAINABLE FEED AND FUEL SOURCE
9:20 AM	<u>Russ W. Gesch</u> , Yesuf A. Mohammed, and Heather L. Matthees	RELAY-CROPPING PENNYCRESS AND SOYBEAN: SELECTING INTERSEEDING DATE AND SOYBEAN MATURITY
9:40 AM	<u>Yesuf Assen Mohammed</u> , Russ Gesch, Samantha Wells, Nicholas Heller, Alexander Lindsey, Alexander Hard and Bethany Wohrley	DOES CORN HYBRID SELECTION PRECEDING PENNYCRESS PLANTING AFFECT SEED YIELD AND QUALITY IN THE US CORN BELT?
10:00 AM	Coffee Break	

10:20 AM	<u>Liv S. Severino</u> , and Adriana P. Sales	STUDIES ON THE FACTORS CAUSING THE UNEVEN GERMINATION OF CASTOR SEED
10:40 AM	<u>Mukhlesur Rahman</u> , A. Rahman, M.Z. Alam, and M.G. Robbani	MODERN OILSEED BREEDING: FROM HIGH-THROUGHPUT PHENOTYPING TO GENOMIC SELECTION
<b>11:00-11:30 AM</b>	<b>Oilseeds Division Meeting- Division Chair: Hussein Abdel-Haleem</b>	

## 5. Natural Rubber and Resins Division

**Moderator: Guangyao (Sam) Wang**

**Room: Lewis and Clark**

8:00 AM	<i>Invited speaker:</i> <u>Colleen McMahan</u> , Edward Baidoo, Chen Dong, Jackie Jarvis, Grisel Ponciano, Andrew Nelson, and F. Omar Holguin	CONSIDERING PRIMARY AND SECONDARY CARBON METABOLISM IN GUAYULE ( <i>Parthenium argentatum</i> G.)
8:30 AM	<u>Almudena Olivas del Rey</u> , Horacio López-Córcoles, Francisco Miguel Jara, Jose Antonio Reche-Vilches, Amaya Zalacain, and Manuel Carmona	ARVENSE FLORA CONTROL IN TRANSPLANTED GUAYULE IN CASTILLA-LA MANCHA (SPAIN)
8:50 AM	<u>Grace Q. Chen</u> , Grisel Ponciano, Chen Dong, Niu Dong, Kumiko Johnson, Trinh Bolton, Tina Williams, Delilah F. Wood, Dante F. Placido, Colleen McMahan, and John M. Dyer	OVEREXPRESSING AN ARABIDOPSIS <i>SEIPINI</i> AFFECTS RUBBER PRODUCTION IN GUAYULE
9:10 AM	<u>Haruhiko Yamaguchi</u> , Yukino Miyagi-Inoue, Ryo Kutsukawa, Riki Imaizumi,	BIOSYNTHESIS OF NON-NATURAL POLYISOPRENOIDS BY FUNCTIONALLY MODIFIED <i>CIS</i> -PRENYLTRANSFERASES

	Miki Suenaga-Hiromori, Syuto Misawa, Toshiyuki Waki, Toru Nakayama, Satoshi Yamashita, and Seiji Takahashi	
9:30 AM	<u>Katrina Cornish</u> , David Ramirez-Cadavid, and Sarah Davis	A ROUTE TO SCALABILITY: GUAYULE LATEX RADIATION ATTENUATION GLOVES
<b>9:50-10:20 AM</b>	<b>Coffee Break</b>	
10:20 AM	<u>Von Mark V. Cruz</u> , Daniel Carver, Claire Heinitz, and Colin K. Khoury	PREDICTING GUAYULE GROWING AREAS AND COLD INJURY USING MAXIMUM ENTROPY (MAXENT) MODELING
10:40 AM	<u>Serge Palu</u> , A. Amor, and M. Dorget	TOWARDS ALTERNATIVE SOURCES OF NATURAL RUBBER
11:00 AM	<u>Mostafa Dehghanizadeh</u> , B. Silagy, J. Quinn, and Catherine E. Brewer	FEASIBILITY OF SUPERCRITICAL CO <sub>2</sub> EXTRACTION FOR GUAYULE RESIN AND RUBBER EXTRACTION
11:20 AM	<u>Guayente Latorre</u> , Sara Rodrigo-Gómez, Enrique Fernández-Carrillo, María Engracia Carrión, M. Mercedes García, Amaya Zalacain, Gonzalo Ortiz de Elguea-Culebras, and Manuel Carmona	REPELLENT AND ANTIFEDANT ACTIVITY OF ESSENTIAL OILS AND GUAYULE RESIN AGAINST <i>Labidostomis lusitanica</i>
11:40 AM	<u>Brooke Silagy</u> , J. Quinn, M. Dehghanizadeh, C. Brewer, A. Smith, and K. Ogden	IMPROVING GUAYULE'S ECONOMIC COMPETITIVENESS -- A TECHNO-ECONOMIC EVALUATION OF TWO RESIN CO-PRODUCT PATHWAYS
<b>12:00 PM-1:30 PM</b>	<b>General Membership Luncheon Meeting</b>	
1:40 PM	<u>Francisco M. Jara</u> , M. Engracia Carrión, Horacio López-Córcoles, M. Mercedes García-Martínez, Jose Antonio Reche-Vilches, Almudena Olivas del Rey,	RESIN PRODUCTION VARIABILITY IN GUAYULE ( <i>Parthenium argentatum</i> Gray) AND HYBRIDS IN CASTILLA-LA MANCHA (SPAIN)

	Amaya Zalacain, and Manuel Carmona	
2:00 PM	<u>M. Engracia Carrión</u> , Guayente Latorre, M. Mercedes García-Martínez, Amaya Zalacain, and Manuel Carmona	GUAYULINS STABILITY IN GUAYULE ( <i>Parthenium argentatum</i> Gray) HARVESTED STEMS AND RESIN
2:20 PM	<u>Guangyao (Sam) Wang</u> , Diaa Eldin M. Elshikha, Matthew E. Katterman, Theresa Sullivan, Stefan Dittmar, Von Mark V. Cruz, Douglas J. Hunsaker, Peter M. Waller, Dennis T. Ray, and David A. Dierig	DEFICIT IRRIGATION ON SEASONAL GROWTH AND RUBBER PRODUCTION OF DIRECT-SEEDED GUAYULE
2:40 PM	<u>Von Mark V. Cruz</u> , Colleen McMahan, Katrina Cornish, and Michel Dorget	REVIEW OF DIFFERENT ANALYTICAL METHODS FOR QUANTIFICATION OF GUAYULE RUBBER AND RESIN IN PLANT TISSUES
<b>3:00-3:30 PM</b>	<b>Rubber and Resins Division Meeting, Division Chair: Sam Wang</b>	

<b>3:30-4:30 PM</b>	<b>AAIC board meeting</b>
<b>5:00-8:00 PM</b>	<b>AAIC Awards Banquet Guest Speaker:</b>

## Poster Presentations

Room: Foyer

<b>GENERAL CROPS &amp; PRODUCTS</b>		
1	<u>Efthymia Alexopoulou</u>	BRIDGING THE GAP BETWEEN PHYTOREMEDIATION SOLUTIONS ON GROWING ENERGY CROPS ON CONTAMINATED LANDS AND CLEAN BIOFUEL PRODUCTION
2	<u>Efthymia Alexopoulou</u>	THE MAGIC PROJECT GROWING SELECTED PROMISING INDUSTRIAL CROPS ON MARGINAL LANDS
3	<u>M.L. Flores-López</u> , A.V. Charles-Rodríguez, O. Dionicio-Concepción, A.M. García-Munguía, V.M. Moo-Huchin, J.C. López-Romero, H. Torres-Moreno, J.L. Guía-García, A.A. Hench-Cabrera, and F.J. Camacho-Martínez	<i>RHUS MICROPHYLLA</i> LEAVES EXTRACTS USING OHMIC HEATING WITH INSECTICIDAL ACTIVITY
<b>MEDICINAL AND NUTRACEUTICAL PLANTS</b>		
4	<u>Diana Jasso de Rodríguez</u> , Dennise Anahí Carrillo-Lomelí, Victor Manuel Moo-Huchin, and José Ángel Villarreal-Quintanilla	CHARACTERIZATION OF MEXICAN WILD <i>OPUNTIA</i> SPECIES FOR DEVELOPMENT OF FILMOGENIC SOLUTIONS
<b>NATURAL RUBBER AND RESINS</b>		
5	<u>O.J. Idowu</u> , M. Omer, V.M. Cruz, and S. Wang	NITROGEN AND PHOSPHORUS FERTILIZER EFFECTS ON GUAYULE IN AN ARID SANDY SOIL
6	<u>Ana Molina</u> , Emilio J. González, M. Mercedes García-Martínez, M. Isabel Berruga, Guayente Latorre, Amaya Zalacain <sup>2</sup> , and Manuel Carmona	FUNGISTATIC EFFECT OF GUAYULE RESIN AGAINST DAIRY PRODUCT FUNGI
7	<u>M. Mercedes García-Martínez</u> , Beatriz Gallego, Guayente Latorre, Jorge Hurtado de Mendoza, M. Engracia Carrión, Amaya Zalacain, and Manuel Carmona	CORRELATION OF THE ARGENTATINS QUANTITATION BY LC-HRMS AND FLOW INJECTION ANALYSIS (FIA-HRMS) IN THE GUAYULE RESIN

8	<u>Grisel Ponciano</u> , Von Mark Cruz, David Dierig, Chen Dong, Andrew Nelson, Claire Heinitz, and Colleen McMahan	COMPARATIVE ANALYSIS OF RUBBER BIOSYNTHESIS IN GUAYULE ( <i>Parthenium argentatum</i> Gray) AMONG DIFFERENT GROWING LOCATIONS IN THE US
<b>OILSEEDS</b>		
9	<u>Jennifer Lachowiec</u> , Anapaula Astorga Bedoya, and Racheal N. Upton	ANALYZING SUSTAINABLE NITROGEN NUTRITION FOR EFFICIENT CAMELINA PRODUCTION
10	<u>S.C. Cermak</u> , G. Biresaw, Y. Chen, L. Chen, H. Ngo, K. Wagner, and K.E. Vermillion	ISO-OLEIC ESTOLIDES WITH SUPERIOR COLD FLOW PROPERTIES
11	<u>R. Evangelista</u> , A. Parrish, D. Joos, P. Alberti, S. Cermak, M. Hojilla-Evangelista, and M. Berhow	INDUSTRIAL GRAIN HEMP VARIETY TRIAL IN ILLINOIS – 2021
12	<u>Jennifer Lachowiec</u> , Ian Mackay Oehler, Dakota Rygh, R N Upton, and Fernando Henrique Correr	NATURAL VARIATION IN BIOMASS ROBUSTNESS OF <i>CAMELINA SATIVA</i>
13	<u>Mary E. Phippen</u> , and Winthrop B. Phippen	DEVELOPMENT OF A RAPID ASSAY FOR TOTAL GLUCOSINOLATE CONTENT IN PENNYCRESS ( <i>Thlaspi arvense</i> L.) SEED BY MEASUREMENT OF ENZYMATICALLY RELEASED GLUCOSE USING A BLOOD GLUCOSE METER AND TEST STRIPS
<b>FIBERS AND CELLULOSICS</b>		
14	<u>Saptarni Chanda</u> , Dilpreet S Bajwa, Mohiuddin Quadir, and Karan Bansal	AMINE COMPATIBILIZATION OF CELLULOSE NANOCRYSTALS TO IMPROVE DISPERSION AND PHYSICO-MECHANICAL PROPERTIES IN HIGH DENSITY POLYETHYLENE POLYMER
15	<u>Ashton O. Chan</u> , D.S. Bajwa, and K. Hartman	ENHANCING THE MECHANICAL PROPERTIES OF WOOD VIA CELLULOSE NANOCRYSTAL (CNC) IMPREGNATION
16	<u>Daniel Blake</u> , D.S. Bajwa and Adam Gladen	DEVELOPMENT OF NANOCELLULOSE BASED THERMAL ENERGY STORAGE MATERIAL

