



# Digital Moisture Measurement Tools for Seed cotton Mass



BIOS AGROSYSTEMS SA  
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Technology Forum 2024, 25.04.2024  
Ioannis Vellidis Congress Centre  
IFS Awards 2024



Πρόγραμμα Κεντρική Μακεδονία 2021-2027



## MISSION STATEMENT

**«The aim of the Group is to engage in the field of Agriculture, in order to cover all needs of the farmer and the consumer alike, by offering an integrated package of products and services»**

**BIOS AGROSYSTEMS** was established by the Efthymiadis Group in 1990 and holds a leading position in the sector of seed production & seed processing of field crop cultivars.

The 30+ years experience of BIOS in this field, its collaborations with many national and multinational companies, its industrial facilities as well as the continuous upgrades of mechanical equipment and infrastructure, makes BIOS a reference company in the market in which it operates, and are the capable elements that contribute to its further development.



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2021-2027



## Company's activities

Seed production

Cotton breeding - R&D

Seed processing (cotton, corn, cereals, rice, alfalfa, etc)

Quality control services & logistics

Vegetable seeds trading

International markets



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2021-2027



## CHALLENGE

**To develop and produce a portable Digital Meter, for continuing measurement of the moisture in Seed cotton Mass**

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### Cotton importance

**33,5 mil hectares globally**

### Seed (raw) cotton moisture importance

Cotton seed for planting quality

Seed cotton harvested quality

Lint quality after ginning

## Description of the CHALLENGE

The aim is to continuously monitoring the moisture of the raw cotton, from harvesting to ginning. In research level, new technologies like sim-sized sensors have been used for this process. These sensors are placed in the center of the mass, and they are providing information about the product's moisture. However, they could also provide information on identification and tracking. These sensors can be used only once, and they are thrown away afterwards.

## Expectations of the CHALLENGE

To develop & manufacture a handheld device, based on such kind of sensors, which could be used for monitoring moisture content during transportation and storage before ginning.

## General overview

- Cotton moisture impacts cotton from field to fabric.
- Moisture content at harvest is a key parameter that impacts quality and how well the raw cotton can be stored without degrading before processing
  - Excessively high moisture content can lead to deterioration of seed cotton quality and cause discolored lint and spoiled seed.
- Generally speaking, the most important times to measure the moisture of cotton is at the time of harvest and once again as it is being ginned.
- Thus, use of moisture sensors are critical to ensure cotton gins produce seed & bales at a MC that is safe for long term storage and transport.
- Resistance sensing of moisture is an indirect method that relies on the physical principal that when water is introduced into cotton fiber, the water provides a lower impedance pathway for electrons passing through the cotton, which lowers the resistance to electrical flow that can be measured easily with a meter.

## Why moisture of raw cotton is important

Moisture content of the raw cotton is crucial for the quality of the seeds, the yarn and the textiles

Cotton seed is a part of raw cotton, and its quality is been affected by the moisture of raw cotton

Cotton seed is a propagation material

BIOS is producing ~ 75% of the planting cotton seed that been used in Greece

Furthermore, cotton seed has more than 100 uses in our everyday life

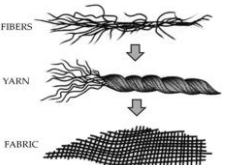


# Uses of cotton seed

<b>KERNEL</b>										
<b>MEAL &amp; CAKE</b>			<b>CRUDE OIL</b>							
<b>FERTILIZER</b>	<b>FEED FOR</b>	<b>FISH BAIT</b>	<b>REFINED OIL</b>	<b>SOAP</b>	<b>LIVE STOCK FEED</b>	<b>GLYCERINE</b>	<b>FATTY ACIDS</b>	<b>MOLE CRICKET BAIT</b>		
LAWNS	BEEF CATTLE		SNACK FOOD FRYING			EXPLOSIVES	METALLIC SOAPS			
MUSHROOMS	DAIRY CATTLE		SALAD & COOKING OIL			PHARMACEUTICALS	WATERPROOFING			
SHRUBS	SHEEP & GOATS		MAYONNAISE			FOOD PREPARATIONS	RUBBER			
FLOWERS	HORSES & MULES		SALAD DRESSING			COSMETICS	PLASTICS			
FISH PONDS	POULTRY		SHORTENING				CHEMICAL FOOD STOCK			
	SWINE		MARGARINE				FUNGICIDES			
	FISH		PACKING OIL (SARDINES etc)				FENESHES			
	SHRIMP		BAKING & FRYING OILS				INSECTICIDES			
			CARRIER FOR AGRICULTURAL SPRAYS							
<b>HULLS</b>										
<b>FEED FOR</b>	<b>MULCH &amp; SOIL CONDITIONER</b>		<b>BRAN</b>	<b>POULTRY LITTER</b>	<b>OIL WELL DRILLING MUD</b>	<b>FURFURAL</b>				
BEEF CATTLE			LIVESTOCK FEED			SYNTHETIC RUBBER				
DIARY CATTLE						PETROLEUM REFINING				
SHEEP & GOATS						PLASTICS				
HORSES & MULES										
<b>LINTERS</b>										
<b>DISSOLVING PULP</b>						<b>FELTS FOR</b>	<b>YARNS</b>	<b>ABSORBANT COTTON MEDICAL GRADE</b>	<b>FIBER PULP</b>	
<b>CELLULOSE NITRATE</b>	<b>VISCOSE</b>		<b>CELLULOSE ESTERS &amp; ETHERS</b>	<b>CELLULOSE ACETATE</b>						
	<b>FOOD CASINGS</b>	<b>RAYON</b>		<b>PLASTICS</b>	<b>FILMS</b>	<b>YARNS</b>			<b>PAPERS</b>	
PLASTICS	BOLOGNA SAUSAGES	AIR HOSE	LACQUERS	OUTDOOR SIGNS	PHOTOGRAPHICS	CLOTHING	AUTOMOTIVE UPHOLSTERY	LAMP & CANDLE WICKS	COTTON SWABS	FINE WRITING PAPER
DYNAMITE	FRANKFURTERS	INDUSTRIAL FABRICS	PHARMACEUTICAL EMULSIONS	TOILET WARE	PACKAGING	HOUSEHOLD FABRICS	PADS	TWINE	COTTON BALLS	FILTER PAPERS
FINGERNAIL POLISH			HAIR CARE PRODUCTS	WINDSHIELDS	ENVELOPE WINDOWS		CUSHIONS	RUGS	GAUZE PADS	DOCUMENT & SECURITY PAPERS
SMOKELESS GUN POWDER			COSMETICS	TOOL HANDLES	CLEAR SHEET PROTECTORS		FURNITURE UPHOLSTERY	ADPS	PAPERS	CURRENCY
SOLID ROCKET PROPELLANTS			PAINT	AUTOMOTIVE PARTS	RECORDING TAPES		COMFORTERS			LAMINATING PAPERS
			TOOTHPASTE	ELECTRICAL EQUIPMENT	TRANSPARENT TAPE		MATTRESSES			SANITARY PRODUCTS
			ICE CREAM	PENS & PENCIL BARRELS	X-RAY FILM					BATTERY SEPARATORS
			SALAD DRESSINGS	NOVELTY ITEMS						



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