



# MSU

## Researches Crops for the Future

Story and photos  
By Robert H. Wells



Valtcho Jeliakov

Today's niche crops may become tomorrow's major commodities as Mississippi State University researches the production potential for oilseed crops and medicinal herbs grown in Mississippi.

"In general, these crops are cash crops that would provide higher economic returns for farmers than the now-traditional field crops," said the head of the research, Valtcho Jeliakov, a MSU researcher at the North Mississippi Research and Extension Center, or NMREC, in Verona.

"We are looking five to 10 years from now," Jeliakov said. "Assuming certain shifts in the priorities of agriculture in Mississippi and the U.S, I envision the production of oilseed crops for biodiesel to be one of the major prospective opportunities for Mississippi farmers."

Oilseed crops are crops such as soybeans that produce vegetable oils for use in both nutritional and industrial applications.

As part of MSU's Specialty Crops and New Product Development research program, Jeliakov is fine-tuning the agronomic needs of oilseed crops such as sunflower, mustard, crambe and camelina to determine if any of them could be the next soybean.

"Soybeans may be the best example of a crop that was introduced to the U.S. from Asia as a niche crop," said Michael Collins, head of the Plant and Soil Sciences department at MSU in Starkville. Collins helped secure the funding for Jeliakov's project.

"This species was originally introduced as a forage crop but did not go over well for that use," Collins said.

Now more than 1.5 million acres of soybeans are harvested in Mississippi each year, and its production adds more than \$300 million dollars to the state's economy annually.

The oilseed crops in Jeliakov's study offer potentially higher oil concentrations than soybeans, less input costs and unique nutritional benefits.

The second facet of Jeliakov's research is the study of nearly 50 different medicinal and aromatic herbs, including St. John's Wort, valerian, lemon balm, lavender, oregano and three types of basil.

These small crops can offer substantially more revenue per acre than traditional field crops such as cotton, corn and soybeans, but their value depends on their growing conditions.

"Factors such as fertilization, irrigation, weed and pest control, location, soil properties, temperature and ultraviolet radiation affect essential oil composition and thus the quality and the market price," Jeliakov said. "We are trying to determine the optimal conditions for these medicinal and aromatic crops that would ensure the highest product quality."

Jeliakov has research set up throughout Mississippi at MSU experiment stations in Verona, Stoneville, Crystal Springs, Beaumont, Poplarville and Newton.

"There are multiple locations for this project because we have a wide geographic range across the state, north to south," said Wayne Ebelhar, an agronomist at the Delta Research and Extension Center in Stoneville. "Since these plants are not necessarily adapted to Mississippi, different locations serve as mechanisms to evaluate their potential."

As a cooperator with Jeliakov on the project, Ebelhar oversees the maintenance and harvest of the herb and oilseed



crops planted at the Delta station. Once harvested, plant samples are dried and sent to Verona for essential oil and quality tests.

Essential oil crops first became an interest for Jeliaskov when he was a young boy growing up in Bulgaria.

"In the village where I lived, there was a large state farm that grew a lot of essential oil crops such as lavender, dill, fennel, clary sage, and others," recalled the researcher. "I still remember the aroma of those large fields in those long summer days, memories that are very dear to me."

Jeliaskov later worked at the state farm in his village and eventually earned a Ph.D. in agronomy in 1988 from the Higher Institute of Agriculture in Plovdiv, Bulgaria. His research included peppermint propagation and weed control, along with the effect of these practices on essential oil composition. After moving to North America, he earned a second Ph.D. from the Plant and Soil Sciences department at the University of Massachusetts in 2001. In October 2005, Jeliaskov joined the NMREC in Verona as an assistant research professor.

"I think he's an excellent addition to our staff," said Alan Blaine, head of the North Mississippi Research and Extension Center in Verona. "The areas Valtcho is working on are cutting-edge technology."

Blaine noted the importance of Jeliaskov's research into the potential value of medicinal crops and of oilseed crops with high oil concentrations grown in Mississippi.

"His research will give us an opportunity to look at some alternative crops for the state," Blaine said. "Somebody has got to do this work, and any new discoveries will be beneficial to our population."

Jeliaskov is confident in his mission to bring new crop options to the state.

"Our goal is to improve the economic and environmental sustainability of cropping systems in Mississippi through the introduction of new specialty crops and the development of new cropping systems and new products," Jeliaskov said. "I believe our research will benefit primary agricultural producers and contribute to transforming the U.S. from net importer of medicinal plants and plant-derived chemicals to net exporter."

