



USDA's Outlook Forum lists potential problems facing sustainable bioenergy production

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Washington, Feb. 18 – As biofuels and biomass production ramps up in the U.S., speakers at USDA's annual Outlook Forum raised concerns Thursday about potential conflicts and the risk of triggering new waves of "bioinvasion."

Soil Science Professor Rattan Lal of The Ohio State University warned against calling crop residues "waste." He listed a score of competing uses for residues and showed slides of side-by-side corn plots in Nigeria – one lush and one nearly barren after a dozen years of removing the crop residue for biofuels production. Saying "There's no such thing as a free biofuel from crop residues," he said the residues are essential for maintaining productive soils rich in organic matter, teeming with biota and earthworms, protected from erosion, and vital in providing ecosystem services such as nutrient cycling and carbon sequestration. He said such services cannot be achieved "without leaving the crop residue on the land."

Dr. Lal dismissed the hope of raising bioenergy crops on degraded soils as a myth and said the reality instead is that it will be a challenge to grow enough new crops to produce 21 billion gallons of cellulosic ethanol by 2022 as mandated by current law. He concluded that "humus capital" is a national asset which must be protected, not mined.

Assistant Extension Non-Crop Weed Ecologist Joe DiTomaso of the University of California-Davis said one piece of good news about bioenergy crops is that biofuels remains a "fledgling industry" – which means there's still time to develop policies to anticipate possible problems. He noted that all three top contenders as future bioenergy crops, Miscanthus, switchgrass and giant reed all are listed in at least some states as invasive noxious weeds. He pointed out that the same characteristics such as being perennial, drought tolerant and salt tolerant which make these species promising bioenergy crops, also make them successful invasives.

DiTomaso pointed out that the federal National Invasive Species Council (NISC) warned last August that "certain plant species being proposed for biofuel production in the U.S. are invasive species or are likely to escape cultivation and become invasive. . . Absent strategic mitigation efforts, there is substantial risk that some biofuel crops will escape

cultivation and cause socio-economic and/or ecological harm.” Among the nine recommendations adopted by NISC, DiTomaso emphasized seeking sterile cultivars, research to select the most appropriate areas for cultivation, and “Recommendation #7: Develop and Implement Early Detection and Rapid Response (EDRR) Plans and Rapid Response Funding. Develop EDRR plans that cover multiple years to eliminate or prevent establishment and spread of escaped invasive populations.” (Read the four-page NISC paper at: www.invasivespecies.gov/home_documents/BiofuelWhitePaper.pdf .)

USDA Agricultural Research Service (ARS) Research Leader Douglas Karlen broadened the bioenergy picture by saying there’s a need not to just select suitable areas for particular crops but also to create an “Integrated Landscape” which accounts for a wide range of variables. He described the ARS’s national REAP (Renewable Energy Assessment Project) which is designed to “Develop biomass feedstock harvest rates and management strategies that safeguard the soil so it can meet the demand for food, feed, fiber and fuel.”

Karlen, working at the ARS National Soil Tilth Lab in Ames, Iowa, says REAP is based on “recognizing nature’s diversity” because “our current model is not sustainable.” He says “When we deal with land, landscapes and soils, trying to apply the traditional industrial model doesn’t work.” Instead, REAP aims for a site-specific watershed approach which protects water by locating woody species and perennial grasses along stream banks while reserving intensive crop production for highly productive areas on higher land protected by filter and buffer zones which control leaching and runoff.

Karlen concludes that “bioenergy and conservation are compatible if we utilize multiple feedstock options, multiple conversion platforms. . . recognizing that there is no single solution.” He says the first step must be to methodically assess what combination of crops and livestock will work best for each specific location. He also noted, however, that his work to implement this “Integrated Landscape” approach in central Iowa “is still tied up in politics.”

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