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Foundation for Food and Agriculture Research Name First Executive Director

The Foundation for Food and Agriculture Research (FFAR) named Dr. Sally Rockey as its first executive director. Dr. Rockey is currently the deputy director of extramural research at the National Institutes of Health and will bring her 19 years of experience at USDA to the Foundation starting in September, 2015.

FFAR was established in the 2014 Farm Bill. Congress provided $200 million for the Foundation that must be matched by non-federal funds as the Foundation identifies and approves research projects. The Foundation operates as a non-profit entity seeking to address problems of national and international significance. For more background on FFAR, as well Dr. Rockey's bio, please visit: http://www.far.foundation/first-executive-director.html

Milkweed, Monarchs, and Pollinator Protection

The issues of milkweed, monarchs, and pollinator protection continues to be a hot topic in Washington D.C. In mid-May, the White House, through the Office of Science and Technology Policy issued the Pollinator Research Action Plan. The plan focuses on increasing honeybee and monarch butterfly numbers through the creation and maintenance of pollinator habitat. In conjunction with this effort, the EPA has also issued a Proposal to Protect Bees from Acutely Toxic Pesticides. These regulations would prohibit the application of pesticides that are acutely toxic to bees during bloom in crops where honey bee pollination services are contracted. The comment period on these regulations will remain open until July 29.

On June 24, the EPA also published a document in the federal register titled "Risk Management Approach to Identifying Options for Protecting the Monarch Butterfly". This document is the start of the process which will depend upon (i) input from a diverse group of stakeholders to identify and integrate information with respect to influences on the population dynamics of the monarch butterfly and the milkweed plant; and, (ii) cooperation and collaboration from these diverse stakeholders to identify activities that will balance weed management needs across varied landscapes with conservation of the milkweed plant." The 30 day comment period ends July 24.

As a bit of good news regarding pollinator protection, the Senate Environment and Public Works committee marked up a 6 yr transportation bill (DRIVE Act, S. 1647) that included an amendment from Sen. Gillibrand (D-NY) that WSSA supported which encourages pollinator habitat along transportation rights-of-ways. This is the first time a provision like this was included in the Senate to encourage pollinator habitat on transportation rights-of-ways. Some of the provisions in the amendment include: 1) conduct or encourage integrated vegetation management practices on roadsides and other transportation rights-of-way, including reduced mowing; 2) enhance the development of habitat and forage for Monarch butterflies, other

native pollinators, and honey bees through plantings of native forbs and grasses, including noninvasive, native milkweed species that can serve as migratory way stations for butterflies and facilitate migrations of other pollinators; 3) encourage leveraging through partnerships and coordination with stakeholders in support of pollinators and plantings of native forbs and grasses, such as environmental groups, research institutions, other agencies, businesses, and community organizations; and 4) conduct or facilitate research and demonstration projects on the economic and environmental benefits and best practices for integrated vegetation management, reduced mowing, and plantings of native forbs and grasses for pollinator habitat, forage, and migratory way stations for Monarch butterflies and other migrating pollinators.

EPA Responses to IARC Reports for Glyphosate and 2,4-D.

Glyphosate: In 1991 EPA concluded that glyphosate should be classified as a Group E (evidence of non-carcinogenicity for humans) based on a lack of convincing carcinogenicity evidence and considering the criteria in EPA Guidelines for classifying a carcinogen. Since then, EPA has monitored emerging research on the carcinogenicity of glyphosate.

In 2014, EPA reviewed over 55 epidemiological studies conducted on the possible cancer and non-cancer effects of glyphosate. Our review concluded that this body of research does not provide evidence to show that glyphosate causes cancer, and it does not warrant any change in EPA's cancer classification for glyphosate. This is the same conclusion reached in 2004 by the United Nations' Food and Agriculture Organization and affirmed this year by Germany's pesticide regulatory officials. In a few months, EPA will be releasing for public comment our preliminary human health risk assessment for glyphosate as part of our program to reevaluate all pesticides periodically. EPA is aware of the recent International Agency for Research on Cancer (IARC) report and will address it in detail in the preliminary risk assessment. Additional information regarding glyphosate and EPA's ongoing registration review can be found at: http://iaspub.epa.gov/apex/pesticides/f?p=CHEMICALSEARCH:31:0::NO:1,3,31,7,12,25:P3_XCHEMICAL_ID:2477

2,4-D: On June 23rd, the IARC released a scientific assessment which retains the group's previous classification of 2,4-D as a "2B carcinogen" (possibly carcinogenic to humans). This resulted from the June 3rd, 2015 United Nations World Health Organization's International Agency for Research on Cancer (IARC) meeting to review the carcinogenic potential of 2,4-D.

EPA reviewed 2,4-D in 2014 as part of its decision to register Enlist Duo and found that the data do not support a cause and effect relationship between exposure to 2,4-D and non-Hodgkin's lymphoma. This is the same conclusion reached by an earlier review of the issue by the FIFRA Scientific Advisory Panel.

2,4-D is currently undergoing registration review, EPA's periodic review of pesticide registrations to ensure that each pesticide continues to satisfy the statutory safety standard for registration; that is, the pesticide can perform its intended function with reasonable certainty of no harm to people from residues in food and water and that it will not cause unreasonable adverse effects on the environment when used according to the product label. Through this

program, EPA is ensuring that each pesticide's registration is based on current scientific and other knowledge, including its effects on human health and the environment.

The scope of the registration review process is to evaluate previously conducted human health risk assessments using the most recent scientific information, agency policies, and risk assessment methodologies in order to identify data deficiencies and future actions/work needed for the pesticide. The risk assessments and toxicology for 2,4-D will be revisited during this process and will include IARC's assessment after publication of Volume 113 of the IARC Monographs. EPA will determine whether any risk mitigation is needed to address unreasonable risks to humans.

Currently, we expect to release for public comment the draft human health risk assessment for 2,4-D in March 2016.

Illinois Farm Data Indicates Mixing MOA's More Effective Than Rotating Them

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A recently published study by weed scientists at the University of Illinois and USDA-ARS, looking at glyphosate-resistant waterhemp, is providing valuable evidence that points to management practices as the driving force behind herbicide resistance, and that herbicide mixing, as opposed to herbicide rotation, is the most effective tool in managing resistance.

Pat Tranel said this is not the first time researchers have presented evidence that herbicide rotation is not the best resistance management strategy. "This paper is valuable because these conclusions were obtained doing our experiment in a more 'real-life' fashion," Tranel said. "This study confirmed previous conclusions that farmers should use herbicide mixing rather than rotation."

During the study, they evaluated glyphosate-resistance incidences, as well as landscape, soil, weed, and farm-management data from 105 central Illinois grain farms, including almost 500 site-years of herbicide application records. Having this data, collected between 2004 and 2010, helped the researchers identify relationships between past herbicide use and current glyphosate-resistance occurrences.

Tranel said when glyphosate-resistant waterhemp was first reported in Illinois in 2006, researchers working at the site saw some fields that were infested with waterhemp, but adjacent fields that were free of the weed.

"We asked, 'what is different between these two fields? Is it what the farmers are doing?' We asked a retail applicator to let us review all the management practices data from 100 fields—50 that have resistant waterhemp and 50 that don't," Tranel said.

"We took the results of what farmers have already done, and asked what is different in the fields that have resistance versus the ones that don't," he added.

After collecting the management data, sampling waterhemp from the fields, and screening seeds from the field for resistance back in their greenhouses, the researchers analyzed that data for management factors most associated with resistance. Overall the researchers examined 66 variables related to environment, soil, landscape, weed community, and weed management.

“We looked at every factor we could think of in terms of management and landscape,” Tranel said. “We found that it was management factors that are the most important. It doesn’t matter whether you’re next to a water course that might bring in new seed, what the waterhemp density of your field is, etc. It’s what you did in your field that matters.

“That’s what’s encouraging,” he added. “It’s not inevitable that if your field is next to a water course, for example, you will have resistance.”

Aaron Hager, a co-author on the study, explained that the occurrence of glyphosate-resistant waterhemp was greatest in fields where glyphosate had been used in over 75 percent of the seasons included in the analysis, where fewer MOAs were used each year, and where herbicide rotation occurred annually. “Simply rotating herbicide MOAs actually increased the frequency of resistance,” he said.

On the other hand, Tranel said that the farmers who were using multiple herbicides per application were least likely to have resistance. “When using an average of 2.5 MOAs per application, you are 83 times less likely to have resistance compared to if you used only 1.5 MOAs per application,” he explained.

“That’s pretty amazing that adding one additional mode of action in your tank reduces your chances of resistance by that much,” Tranel added.

Hager pointed out that this strategy will work only if each component of the tank mixture is effective against the target species. “Effective, long-term weed management will require even more diverse management practices,” he added.

Another piece of good news for farmers is that the researchers did not find an association of proximity between neighboring fields and resistance. “The good thing is not only does management matter, it’s what you do in your own field that matters. Even if a neighbor’s resistance moves, it’s at a small frequency. If you’re doing the right thing it will stay at a small frequency,” Tranel said.

Although there may be some concerns with herbicide mixing, Tranel said it is still the best tool to manage resistance. One concern is the greater expense and environmental load of using multiple herbicides.

Another concern is using the correct mix of herbicides in the tank. Particularly as waterhemp becomes resistant to other herbicides, such as PPO inhibitors, mixing glyphosate and a PPO inhibitor, is not going to be a good management strategy if there is already resistance to a PPO inhibitor, Tranel explained.

"As we have new tools coming like 2,4-D and dicamba-tolerant soybeans, some people may think 'I'll throw in 2,4-D with glyphosate, because that's using two modes of actions,' but if you already have glyphosate resistance then you are not really using two effective modes of action," he added.

"We don't say that mixing is the end-all solution. What we saw from this study if success for farmers is measured by lack of resistance or lower frequency, then successful farmers use multiple herbicides per application."

USDA Releases Federal Noxious Weed Disseminules ID Tool

The Federal Noxious Weed Disseminules of the U.S. (FNWD) was developed by the USDA APHIS Identification Technology Program (ITP) in collaboration with the California Department of Agriculture (CDFA). Most of the content in FNWD is a work of the U.S. Government and is in the public domain. The ID tool was developed to enable accurate identification of federal noxious weeds (FNW) disseminules and to assemble a set of high-quality images of the disseminules of all the FNW taxa. The ID tool and its identification keys were designed to be used by officials at U.S. ports responsible for identification of plant pests. It may also be a useful resource for seed professionals and anyone else with an interest in, or a need to know about, the U.S. federal noxious weeds and what their disseminules look like.

The ID tool provides photographs, text, and keys that aid in determining whether or not an unknown disseminule (e.g., seed, fruit) found as a contaminant in imported botanicals and agricultural products is a FNW and is therefore actionable. The total list of 114 FNW taxa is broken down into smaller groupings, first by Disseminule type—Spores vs. Vegetative vs. Fruits & Seeds. This page describes the various types of disseminules represented within the tool. Taxa with spore and vegetative disseminules are described in fact sheets. The taxa with fruit and seed disseminules (further broken down into three groupings: Poaceae, Fabaceae, and Other Families) can be separated using one of the three associated keys. A Key to Keys assists the user in deciding which of these three keys is appropriate to use for taxon identification. Fact sheets for each FNW taxon pull together relevant descriptions, including distinguishing characteristics and photographs. See: http://idtools.org/id/fnw/

USDA-ERS Report on the Economics of Glyphosate Resistance Management

Data obtained by USDA's Agricultural and Resources Management Survey (ARMS), conducted every year targeting about 5000 fields and 30,000 farms, along with data from the Benchmark study (Shaw et al., 2011) show that weed-management choices that account for the yield and cost effects of glyphosate resistance and maximize returns over time differ from those that ignore the effects of glyphosate resistance by: 1) using glyphosate during fewer years; 2) often combining glyphosate with one or more alternative herbicides; and 3) most importantly, not

applying glyphosate during consecutive growing seasons. As a result, glyphosate resistance is managed more cost effectively and the cumulative impact of returns is higher after about 2 years of managing resistance instead of ignoring it.

The findings of the USDA Economic Research Service (ERS) study suggest that education about the negative consequences of glyphosate resistance and the economic benefits of managing resistance, as well as the common-pool-resource nature of weed susceptibility to glyphosate and the potential benefits of cooperation, could promote resistance-management practices, encourage neighboring farmers to collaborate in managing glyphosate resistance, and increase long-term returns to corn and soybean production.

The USDA-ERS report "The Economics of Glyphosate Resistance Management in Corn and Soybean Production" can be found at: http://www.ers.usda.gov/media/1832877/err184.pdf

WOTUS Rule Finalized. 18 States Sue.

On June 29, the Waters Of The U.S. (WOTUS) rule was officially published in the Federal Register, and subsequently, 18 states filed lawsuits in three separate federal courts seeking to block the administration's expansion of which waters are covered under the jurisdiction of the Clean Water Act (CWA). The rule will take effect Aug. 25, but for judicial review purposes, the rule would be considered final on July 13.

Texas, Louisiana, and Mississippi filed a joint lawsuit in Houston asserting that the EPA's final rule is "an unconstitutional and impermissible expansion of federal power over the states and their citizens and property owners." While the EPA has the authority to regulate water quality, the suit says Congress has not granted the EPA the power to regulate water and land use.

Similarly, Ohio and Michigan filed a joint complaint in an Ohio federal court, while the following 13 states: Alaska, Arizona, Arkansas, Colorado, Idaho, Missouri, Montana, Nebraska, New Mexico, Nevada, North Dakota, South Dakota, and Wyoming are seeking to have the rule overturned in a North Dakota federal court.

The EPA and Army Corps of Engineers first proposed the WOTUS rule in April 2014 and finalized it in May 2015. The rule will reportedly add some two million acres of streams and 20 million acres of wetlands under the jurisdiction of the CWA.

There is also legislation in both the House (H.R. 1732) and Senate (S. 1140) that would repeal the WOTUS rule and require the administration to develop an alternative rule in consultation with state and local governments. In May, the House voted 261-155 to pass its bill. The Senate version was passed by the Environment and Public Works Committee in June, but is awaiting a vote from the full Senate. The Administration said it would likely veto the House and Senate bills, so a two-thirds majority would be needed in both chambers.

U.S. is 22,500 College Graduates Short for Agricultural Jobs

A report from USDA's National Institute of Food and Agriculture (NIFA) and Purdue University, released in May, has found tremendous demand for recent college graduates with a degree in agricultural programs. An estimated 57,900 high-skilled job openings are available annually in the food, agriculture, renewable natural resources, and environment fields, the report found, but there are only about 35,400 new U.S. graduates with a bachelor's degree or higher in agriculture related fields, 22,500 short of the jobs available annually.

College graduates with a degree in "Plant science" can expect to see a very strong job market. Read the report on agriculture jobs in the U.S. *at: "Employment Opportunities for College Graduates in Food, Agriculture, Renewable Natural Resources, and the Environment, United States, 2015–2020."*

GMO Labeling Bill Gets A Lot of Attention

The Safe and Accurate Food Labeling Act of 2015 (H.R. 1599) would require the FDA to regulate the distribution and labeling related to bioengineered foods. The bill was introduced in March and has had hearings in both the House Agriculture and the House Energy and Commerce Committees. H.R. 1599 defines the term "bioengineered organism" as an organism that meets the following three conditions: (a) the organism is a plant (or a seed, a fruit, or any other part thereof), (b) the organism contains genetic material that has been modified through in vitro recombinant DNA techniques; and (c) the modification could not otherwise be obtained using conventional breeding techniques.

H.R. 1599 would require food producers to notify FDA of any bioengineered foods intended to be sold interstate and would prevent the sale of any bioengineered foods not deemed safe by FDA. The bill would prevent FDA from requiring the labeling of bioengineered foods only on the grounds that the foods are bioengineered, however, the FDA could require that alterations of nutritional properties, allergens, or other characteristics of food be listed on food labeling.

The second title of H.R. 1588 directs FDA to define the term "natural" for its use on food and beverage products. The third part of the legislation directs FDA to establish federal standards for food producers who choose to voluntarily label their product for the absence or presence of bioengineered organisms. Finally, H.R. 1599 deals with the issue of preemption (the doctrine that federal law takes precedence over state law) by affirming FDA as the nation's authority for the use and labeling of bioengineered food ingredients and would prevent states from issuing their own food labeling requirements. Although there appears strong support for the measure in the House, its path is unclear in the Senate and beyond.

Recent Reports Support Increased Funding for Food and Ag Research

Riley Foundation's "Pursuing a Unifying Message: A University Perspective"

The Charles Valentine Riley Memorial Foundation released the proceedings of one day meeting on April 6 of university leaders and representatives of the Association of American Universities, the Association of Public and Land Grant Universities, and the Non-land-grant Agriculture and Renewable Resources Universities. Highlights from the meeting were:

- Federal Investments. There was a shared recognition that an alarming lack of federal investment in food, agricultural and natural resources research exists in the United States.
- Societal Needs. A key element of a unifying message must be how food, agricultural and natural resources research addresses societal needs for the common good. Because it encompasses essential societal needs, it could be defined as "the people's research."
- Multiple Federal Agencies. A unifying message should emphasize expanding the total funding portfolio across multiple federal agencies, including U.S. Department of Agriculture, National Science Foundation, National Institutes of Health, U.S. Geological Survey and others.
- A Solution Supply Chain. Research investment fuels the solution supply chain needed to address issues that people are passionate about. A deficit of agricultural research leads to a deficit of innovation. In turn, a deficit of innovation leads to a deficit of solutions.
- Jobs. Adequate research investment should also be framed in terms of employment opportunities, job creation and risks to jobs associated with emerging threats to food and agriculture.
- Educated Workforce. Federally funded research helps universities mentor and prepare the next generation of scientists and specialists in food, agriculture and natural resources. Industry, as well as public institutions, depend on this educated workforce to fill innovation jobs.
- Target Policymakers. Although communicating with the broad American public is important, the unifying message should initially be targeted towards policymakers.
- Collective Efforts. As efforts continue on pursuing a unifying message, these words from Benjamin Franklin are particularly pertinent: "We must all hang together or assuredly we shall all hang separately."

USDA's Annual Technology Transfer Report

On Wednesday, June 24, USDA Secretary Vilsack announced the release of the 2014 Annual Report on Technology Transfer which details research innovations and discoveries that have resulted in inventions and patents that have the potential to benefit the American public. The report included improved products, processes, technologies, and services that may benefit U.S. agriculture and the public at large. During Fiscal Year 2014, USDA filed 119 patent applications and disclosed another 117 inventions. The following discoveries were highlighted by USDA:

- Processes to eliminate up to 98-percent of the allergens from peanuts without compromising their flavor;
- A portable method for identifying harmful bacteria in food that could improve the response to foodborne illness outbreaks;
- A new method for mosquito control that specifically silences genes in the mosquito so it does not pose a danger to other insects, including pollinators; and
- A soil nitrogen test that quickly and inexpensively determines the total plant-available amount of nitrogen in the soil, which environmentally and economically beneficial.

AGree's "Research & Innovation: Strengthening Agricultural Research"

AGree released a report and set of recommendations on agricultural research on June 24. The report focuses on the mechanisms and funding of federal agricultural research more so than

the substance. The AGree co-chairs stressed that Congress has not seriously reviewed the structure of farm and food research and funding in decades and suggested a serious conversation about those issues now, in advance of the 2018 Farm Bill. In addition to increased congressional oversight, other recommendations made by AGree include:

- Making data and findings from publicly funded research more accessible;
- Increasing the integration between research, education, and extension;
- Reviewing research priorities via transparent processes involving stakeholders and end users;
- Re-integrating independent technology assessment into the research priority review process;
- Targeting public research to areas unlikely to be addressed by private industry;
- Increasing competitive grant funding for the Agriculture and Food Research Initiative, Sustainable Agriculture and Education Program, Organic Agriculture Research and Extension Initiative, Specialty Crop Research Initiative, and Crop Protection and Pest Management Grants Program; and
- Making competitive grant funding available to researchers outside of the land grant college and university system and eliminate the 2014 Farm Bill's matching grant requirement for non-land grant institutions and organizations.

Chicago Council's Healthy Food for a Healthy World Report

The Chicago Council on Global Affairs released the report Healthy Food for a Healthy World: Leveraging Agriculture and Food to Improve Global Nutrition, a set of recommendations endorsed by a group of business, scientific, and civil society leaders chaired by former Congressmen Doug Bereuter and former USDA Secretary Dan Glickman. The recommendations in the report include:

- Using US research facilities and universities to train the next generation of food, agriculture and nutrition leaders in the US and abroad;
- Joining government and industry initiatives together to support technologies to reduce food waste and enhance food safety; and
- Convening a bipartisan commission to address tackling nutrition challenges globally.

WSSA Survey of Most Common and Troublesome Weeds

The winner of the $100 drawing for completing the survey of the most common and troublesome weeds was WSWS member, John Vickery , Member, Education & Outreach Committee, Colorado Native Plant Society. Congratulations John!

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