National Sustainable Agriculture Coalition

February 20, 2013

The Honorable Henry A. Waxman,
Co-chair,
Bicameral Task Force on Climate Change
Ranking Member,
Committee on Energy & Commerce

The Honorable Sheldon Whitehouse
Co-Chair,
Bicameral Task Force on Climate Change
Chairman,
Subcommittee on Oversight
Senate Committee on Environment & Public Works

Dear Representative Waxman & Senator Whitehouse:

On behalf of the National Sustainable Agriculture Coalition (NSAC), I am submitting recommendations on actions that the federal government can take to address climate change in response to your request of January 31, 2013.

NSAC represents 99 organizations from around the U.S. on federal policy issues affecting agriculture. We advocate for sustainable and organic farming systems that support family operated farms and ranches, as well as healthy, economically vibrant rural communities.

In 2009, we posted and distributed the policy paper *Agriculture & Climate Change: Impacts and Opportunities at the Farm Level*, with detailed recommendations on federal agency action that could be taken to both reduce on-farm GHG emissions and increase the ability of the nation's farms and ranches to adapt to changes expected from rapid climate change. The policy paper was prepared in part for our work in 2009 on federal climate change legislative proposals. The information and policy recommendations in the paper are still relevant to the role of USDA and federal agriculture programs in addressing climate change in the agriculture sector.

In response to your request for recommendations, we are providing a shorter, updated version of our recommendations on agriculture and climate change that discusses current USDA programs and some of the legislative proposals that NSAC has developed for the next Farm Bill.

Please contact me {by email at mnoble@sustainableagriculture.net, Office Phone: 202-547-5754, cell phone: 202-236-2688} if you have any questions about our recommendations.

Thank you for the opportunity for us to provide our views and recommendations on agriculture policy and climate change.

Sincerely,
Martha L. Noble

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National Sustainable Agriculture Coalition Recommendations
To The Bicameral Task Force On Climate Change
(February 20, 2013)

Overview

On February 4, 2013, USDA issued a report entitled *Climate Change and Agriculture in the United States: Effects and Adaptation.* A key finding in that report is the role that sustainable agriculture practices and systems will play in the adaptation of agriculture to a rapidly changing climate. The report states:

> "Adaptation measures such as developing drought, pest, and heat stress resistance in crops and animals, diversifying crop rotations, integrating livestock with crop production systems, improving soil quality, minimizing off-farm flow of nutrients and pesticides, and other practices typically associated with sustainable agriculture are actions that may increase the capacity of the agricultural system to minimize the effects of climate change on productivity. For example, developing drought and heat resistant crops will improve the ability of farmers to cope with increasing frequencies of temperature and precipitation variability. Similarly, production practices that enhance the ability of healthy soils to regulate waters resource dynamics at the farm and watershed scales will be particularly critical for the maintenance of crop and livestock productivity under conditions of variable and extreme weather events. Enhancing the resilience of agriculture to climate change through adaptation strategies that promote the development of sustainable agriculture is a common multiple-benefit recommendation for agricultural adaptation."

Sustainable farming systems, including organic systems, can and must play an important role in addressing climate change. These systems have been proven to help farmers and ranchers reduce GHG emissions and increase storage of carbon in agricultural soils. These systems can increase the resilience of farming and ranching operations to deal with the climatic changes that appear likely under global warming scenarios. They are also excellent systems for minimizing other conservation and environmental impacts from agricultural production. Farmers and ranchers can also help reduce GHG emissions by incorporating into their farms and ranches renewable energy systems that do not depend on fossil fuels. {See the Appendix attached to these recommendations for more detailed descriptions of key sustainable and organic farming practices.}

A growing body of scientific and applied research supports the following conclusions:

● Protecting grassland and pasture-based agricultural systems and converting row crop systems to grass-based systems can provide for significant levels of retained and newly sequestered soil carbon.

● Simple no-till practices most likely do not sequester new carbon in the soil. The establishment of sustainable and organic systems that include use of cover crops and green manures and the conversion from annuals to perennials for pastures and grassland systems will increase carbon sequestration.

● High levels of synthetic fertilizer can reduce soil carbon, as well as increase NO2 emissions. Sustainable and organic systems reduce or eliminate synthetic fertilizer through the use of nitrogen-fixing plants in rotations, green manures, and animal manures integrated into cropping systems or as part of intensively managed rotational grazing systems. These systems can also retain more nitrogen in soils, reducing nitrogen runoff and leaching which also contributes to NO2 emissions.

● Sustainable and organic livestock production systems that include pastures, perennial forages, and the effective management, composting and incorporation of manure can significantly lower methane emissions from livestock production.

● In addition to reducing GHG emissions, sustainable and organic agricultural systems can provide for better management of water, control soil erosion and provide other conservation benefits that can increase the environmental and economic resilience of farming systems and better enable farmers to cope with rapid climate change.

● Farmers and ranchers have significant opportunities to lower energy use on-farm and to generate on-farm energy, especially solar and wind power. On-farm biofuel production can be based on incorporation of perennial feedstocks or new crops in resource-conserving crop rotations that can result in overall reduction of net GHG emissions from the farm or ranch.

No matter what role agriculture is called on to play in U.S. climate change policy or international climate change frameworks, sustainable and organic farming systems provide the best long-term approach to dealing with climate change, the best future for our nation's farmers, ranchers and rural communities, and the best overall food and farming system for our people.

What Legislation Would You Recommend that Congress Enact To Strengthen the Ability of Federal Agencies To Prevent And Respond To the Effects Of Climate Change?

The 2008 Farm Bill provided authority to the U.S. Department of Agriculture (USDA) to implement policies that recognize the benefits of sustainable and organic agriculture systems for our nation's farmers, ranchers, rural communities and environment in dealing with climate change. Any climate change legislation should augment and complement this USDA authority. As federal climate change authority develops, widespread adoption of sustainable and organic systems should be recognized as fundamental to addressing agricultural concerns related to climate change.

The 2008 Farm Bill expired October 1, 2012 and only some but not all of the Farm Bill's programs have been extended for the first nine months of 2013 with authorization and adequate funding. Congress is expected to take up the new farm bill authorization again in the spring and summer of 2013, though the jury is out on whether the reauthorization will go more successfully than it did in 2012. In any event, when the new bill does work its way through the legislative process, NSAC will be working to ensure that in 2013 Congress reauthorizes and adequately funds the Farm Bill policies and programs discussed in these recommendations that are well-suited to dealing with climate change, as well as adopting new measures that can help address climate change.

Climate-Friendly Farm Bill Reforms

1. Relink federal crop insurance benefits with conservation compliance requirements.

An important measure to reduce GHG emissions from farmland is the re-linking of federal crop insurance benefits to conservation compliance measures that require farmers to implement a conservation plan to control erosion on highly erodible land and to refrain from cultivating wetlands. Although not directly designed to increase soil carbon, conservation plans for erosion control can result in greater use of cover crops and other measures to decrease wind and water erosion and improve soil health that also increase carbon sequestration within the farming system.

In the 1996 Farm Bill, when crop insurance was a relatively modest part of federal agricultural subsidies, Congress choose to delink crop insurance from conservation compliance. Since then, crop insurance has grown to the single largest agricultural subsidy. In testimony to the Senate Agriculture Committee on February 14, 2013, USDA's Chief Economist estimated it is likely that total indemnity payments for 2012 crop year losses could be as high as $17 billion, larger than last year's record $10.8 billion paid on 2011 crop year losses. The time to relink these policies is quite overdue.

2. Enact Sodsaver measures to restrict Farm Bill crop subsidies to farmers who break out native sod.

In 2012, the Senate-passed Farm Bill included a nationwide sodsaver measure that would preserve grasslands by prohibiting federal commodity payments on newly broken native sod, and by reducing federal subsidies for crop and revenue insurance by 50 percentage points on those acres.

The bill also includes two important provisions that prevent gaming of the system to increase revenue insurance coverage at the expense of taxpayers and the environment. One keeps a producer's newly broken sod isolated from other crop acres when calculating insurable yields. The other requires the operator to take a percentage of the county average yield until being able to show a multi-year yield history.

An identical measure, the Protect Our Prairies Act (H.R. 686) was introduced in the House on Feb. 14, 2013.

3. Support Innovative Partnerships to Address Extreme Weather and Other Climate Change Challenges in Agriculture

The Cooperative Conservation Partnership Initiative (CCPI) supports special local and regional conservation projects that involve groups of farmers or ranchers in partnership with USDA, farm, conservation and other non-governmental organizations, state and tribal agencies, and/or other entities. The CCPI ensures specific attention to state and local conservation priorities and concerns, with 90 percent of the funds and acres reserved for projects chosen by the NRCS State Conservationist, in consultation with the NRCS State Technical Committees.

The USDA Secretary must use the remaining 10 percent of the funding for multi-state CCPI projects selected through a national competitive process. Project partnership agreements with USDA can run for up to 5 years. CCPI offers an opportunity to target and leverage resources to address critical conservation issues. It is also the most appropriate vehicle for beginning to deal with increasingly frequent extreme weather events and their impact on agriculture.

a. Integrate the Agriculture Water Enhancement Program (AWEP) into the CCPI allowing NRCS and partners to more effectively target and leverage limited resources to conserve water and improve water quality.

Given the similarities between CCPI and AWEP, the two programs should merge in the next farm bill. This merger could be achieved by incorporating the agricultural water conservation and quality goals of AWEP into CCPI as a specific conservation goal for CCPI, with the option of reserving a certain amount of program funding for the water conservation and water quality goals component. Modification of CCPI could also support greater financial and technical assistance to agricultural producers for activities that provide climate change benefits, including coping with more extreme weather events, increasing resilience to rising temperatures, changes

in precipitation patterns and related climate changes, as well as reducing greenhouse gas emissions.

The new CCPI should direct NRCS to prioritize funding projects in which project sponsors have identified producers participating in the project and the project sponsors to act on behalf of these producers in applying for the program.

The new CCPI should retain the AWEP cooperative agreement option to provide technical assistance and outreach funding. This would allow communities and NGOs to better access this program and provide the technical assistance and outreach needed to impact a project on a community-wide scale.

The new farm bill should also direct NRCS in even stronger terms than the 2008 Farm Bill to provide for flexibility to adjust elements of the conservation programs if it will increase environmental outcomes, better reflect unique local circumstances, and help achieve the purposes of the CCPI project.

The merged program should retain most of the AWEP funding baseline as well as the conservation program funding from CCPI.

b. Develop innovative partnerships between farmers and ranchers, nonprofits organizations, land grant universities and USDA to assist in the development and implementation of on-farm conservation practices, including climate change mitigation and adaptation activities and carbon sequestration.

The new CCPI should include a priority for projects that address conservation and rural community development goals simultaneously, especially targeting areas most at risk of climate change impacts. When community members see conservation as an opportunity to strengthen their community, and make it more resilient, they view it in a positive manner, enabling the further development of conservation and environmental protection and enhancement. If the community is involved, it will strengthen environmental outcomes and, in turn, rural communities.

In addition, the farm bill should be amended to allow CCPI to include funding from the Wetlands Reserve Enhancement Program (WREP) or the Conservation Reserve Enhancement Program (CREP) for specific projects. Such projects would include a sponsor or co-sponsor eligible to enter into a WREP agreement with NRCS or provide enrollment in WREP as an option for the project. The development of a climate change mitigation and adaptation conservation goal would enable farmers to leverage funding from the EQIP, CSP, WHIP, WREP, and CREP programs to receive the technical assistance and funding support they will need to become more resilient in the face of changing weather patterns and events. Climate change is a focus for USDA research projects under the Agriculture and Food Research Initiative. CCPI can complement this key priority by providing the on-the-ground resources to farmers and ranchers to address the risks of climate change.

The new farm bill should provide that 10 percent of the funds for EQIP and WHIP and 10 percent of the allowed acres for CSP be reserved for support of producer contracts approved under CCPI. This is an increase over the 6 percent provided in the 2008 Farm Bill. This reserve would provide an average of $330 million per year over the term of the farm bill for a revised CCPI that includes the goals of AWEP and climate change adaptation and mitigation. The $60 million

annual funding stream currently budgeted for AWEP should be retained for the new merged CPPI, for total funding of nearly $400 million a year.

c. Revitalize Education Assistance, Targeting at Risk Communities

The new conservation title should restore educational assistance to the farm bill conservation programs. A small, specific percentage of total mandatory program dollars should be set aside for this purpose. This funding should be available to extension, non-governmental organizations, community-based groups, educational institutions, conservation districts, and producers. Funding for educational assistance would increase awareness of program opportunities, especially for communities hardest hit by drought and other extreme weather events, enhance producer knowledge, provide training and decision support aids for sustainable system-based approaches to conservation. Restoring educational assistance would also help foster landscape level and watershed and regional cooperative ventures, with a focus on climate change, as well as help assess the environmental performance of such joint ventures.

What Actions or Policies Could Federal Agencies Adopt, Using Existing Authorities, To Reduce Emissions of Heat-Trapping Pollution? What Actions or Policies Could Federal Agencies Adopt, Using Existing Authorities To Make Our Nation More Resilient To the Effects of Climate Change?

*{**Note:** We are addressing recommendations for administrative actions that can reduce GHG emissions and for administrative actions that can make our nation's agriculture more resilient together because a number of the policies, programs and approaches we recommend can address both issues simultaneously.}*

*{**Note:** As discussed above, many of our recommendations for administrative action will depend on funding and authorization, either through a 2013 Farm Bill or continuing extensions of key 2008 Farm Bill programs in 2013.}*

1. Establish a USDA National Priority for Sustainable and Organic Farming Systems

We welcome recent efforts by USDA to develop a **strategic plan for climate change.** We recommend that USDA establish a national priority for the reduction of GHG emissions from agricultural production, sequestering carbon in soils, and assisting farmers and ranchers to adapt to rapid climate change. That policy should have as its cornerstone the support and promotion of sustainable and organic agricultural systems throughout USDA's programs and initiatives. These systems offer the best course for meeting the challenges to U.S. agriculture from rapid climate change, including increased soil carbon storage and reduction of GHG emissions from U.S. agriculture.

USDA has made soil and water quality national priorities, and that is reflected throughout USDA conservation, farming research and rural development programs. By making GHG emissions reduction, carbon sequestration and adaptation to climate change national priorities, USDA should logically focus a significant portion of conservation, energy, research, and rural development program spending on systems and practices that will address these important issues through funding allocation, ranking, support services, financial assistance and other policies throughout its suite of programs.

2. Strengthen USDA Conservation Programs

a. Increase the focus of NRCS conservation programs on climate change and energy conservation.

We agree with the current approach of USDA to have the Natural Resources Conservation Service (NRCS), through existing conservation programs, act as the primary agency for delivering cost-share and technical assistance for GHG emission reductions and carbon sequestration on working agricultural land and through the easement programs within its authority. These programs can and have provided for new and revised standards and targets for specific incentives that encourage carbon sequestration, reduce direct and indirect use of petroleum-based inputs and reduce GHG emission.

These measures to address climate change can be integrated and coordinated with farming systems and practices that provide overall conservation benefits, including healthy soils, sound water management, grazing and pasture land improvements, and other conservation benefits that increase the resilience of our nation's farms and ranches and rural communities.

USDA should continue and expand the use of the Conservation Stewardship Program (CSP) and the Environmental Quality Incentives Program (EQIP), both of which are authorized to promote energy conservation, to assist farmers and ranchers in obtaining energy audits of their operations, improving the energy efficiency of their operations, and establishing renewable energy systems. In addition, federal conservation programs need to reward farmers and ranchers for conservation practices that improve soil health and water and air quality while also reducing GHG emissions, storing carbon and increasing the resilience of agricultural production systems to cope with the impacts of rapid climate change.

More specifically, USDA should:

● Incorporate on-farm energy audits into NRCS comprehensive conservation planning and energy-specific conservation activity plans.

● Increase the capacity of NRCS to provide technical assistance for energy conservation and renewable energy on farms.

● Use grants and cooperative agreements to involve state, local and non-profit partners with expertise in energy audits, energy conservation and on-farm renewable energy systems.

● Increase the number of energy conservation practices and systems approved for technical and financial assistance through conservation programs, especially those which provide for relatively low cost, long-term or permanent farming system changes or use low carbon energy sources such as wind and solar power, and provide significant funding for applicants requesting assistance for energy conservation measures.

● Add, retool and strengthen conservation practices, conservation practice standards and resource management quality criteria to reflect the new emphasis on energy conservation and production, GHG emission reductions and carbon sequestration, making extensive use of decades of sustainable agriculture research results and the on-farm experience of farmers working with agricultural systems.

● Expand the use of EQIP and CSP to fund energy audits and the establishment of on-farm renewable energy, including on-farm biofuels and other bioenergy, especially low carbon energy including wind and solar power**.**

● Provide full life-cycle assessment, including factors such as indirect land use changes related to feed production or other inputs and overall energy consumption, in assessing the net GHG emission levels for systems receiving EQIP or CSP funding intended to reduce GHG emissions. This analysis is particularly important for Concentrated Animal Feeding Operations (CAFOs). CAFOs generally rely on large-scale row crop grain production using synthetic fertilizers and pesticide and often store animal waste in lagoons and other systems that generate additional GHG emissions. Without a comprehensive life-cycle analysis of GHG emissions, public funding could be used to increase net GHG emissions.

● Retain and expand a CSP focus on conservation systems that improve soil quality, including increased soil organic matter, and target CSP enhancement activities on conservation and production systems and practices that minimize overall GHG emissions, including GHG emissions from the production of farm inputs. These practices and systems include but are not limited to conversion of marginal cropland to grass, resource-conserving crop rotations, continuous cover cropping, management intensive rotational grazing, organic conversion, conservation tillage, and advanced high-level integrated nutrient and pest management.

● USDA authority to oversee GHG emission offsets from agricultural production should be administered through existing programs, with a new permanent easement component for the Conservation Reserve Program and the Grassland Reserve Program and with GHG reduction measures incorporated into the Conservation Stewardship Program. This approach will save additional administrative costs and optimize conservation goals and GHG reduction benefits within a unified conservation planning approach.

b. Fully implement the Organic Priority and the special Organic Initiative provision for EQIP and the special focus and organic crosswalk for CSP established in the 2008 Farm Bill.

Promoting organic agriculture will make agriculture more resilient in the face of climate change while reducing GHG emissions from the agriculture production sector.

More specifically, USDA should:

● Modify conservation practice standards to more adequately reflect organic system plans, with special focus on the organic conversion process.

● Train NRCS and other USDA staff in organic systems and assist in the development of a cadre of organic technical service providers.

● In addition to the EQIP Organic Initiative's ensure that EQIP's general program financial and technical assistance resources are available to organic farmers and that both are available through EQIP in every state and country in the nation.

● Incorporate specific CSP enhancements for organic cropping and livestock systems and include organic-specific options for more generally available enhancements such as conservation tillage, pest management, and invasive species control.

● As part of the organic crosswalk between CSP and the National Organic Program, produce decision support tools to assist farmers in making use of both programs in a coordinated manner.

c. Expand the role of the Conservation Reserve Program by including carbon sequestration measures.

The Conservation Reserve Program (CRP) takes land out of row crop production and requires long term grass or tree cover. The CRP clearly provides one of the largest, if not the largest, soil carbon sinks created by a federal program. The CRP and other programs that keep land in permanent cover with predominantly perennial plant systems should be bolstered to ensure that current carbon storage services are not diminished. Changes in these programs may include added payments to enhance the carbon sequestration capacity of these lands while maintaining soil erosion measures and measures for wildlife and water quality protection. The use of these lands for biomass/biofuel feedstocks should occur only if instituted in a way that retains and protects them for multiple ecological functions.

Much could be done to enhance the carbon sequestration potential of CRP lands. Ensuring that more of the land is provided permanent protection from annual crop production would definitively enhance CRP as a means to sequester soil carbon. Permanent protection options could be targeted to the most highly erosive land or land with the highest ecological benefits for wildlife and water protection. Legislation should be considered for a permanent easement option on CRP to serve as soil carbon banks.

We note with approval that USDA fully implemented the 2008 Farm Bill's CRP transition option that provides incentives and assistance to beginning and socially disadvantaged farmers and ranchers to establish organic production systems and managed grazing systems that keep the land in perennial vegetation, both of which can increase the levels of sequestered carbon and lower GHG emissions. By February 2012, the Farm Service Agency, which administered the CRP Transitions Incentives Program, had allocated the $25 million provided in the 2008 Farm Bill for CRP-TIP. Overall, CRP-TIP has 1,626 contracts enrolled or pending enrollment, covering 260,523 acres of land in 26 states. Now, however, it is up to Congress to reauthorize and provide new funding for the transition option in the new farm bill reauthorization.

d. Continue Use of the Conservation Effects Assessment Program to Evaluate the Role of Conservation Programs, Practices and Farming Systems in GHG Reduction.

We note with approval that NRCS issued a Conservation Effects Assessment Program (CEAP) science note in October 2012 (revised in December 2012) entitled *Conserving Prairie Pothole Wetlands: Evaluating Their Effects on Carbon Sequestration in Soils and Vegetation.* This CEAP study evaluated the impact of conservation programs on carbon sequestration in soils and vegetation communities of restored wetland catchments on Wetlands Reserve Program Lands and Conservation Reserve Program Lands. The study indicated that restored wetland catchments can store significant amounts of soil organic carbon, although not as much as native prairie catchments. In addition, the restored catchments may also result in reduction of GHGs such as nitrous oxides and methane. We recommend that CEAP now undertake a comparison of GHG reductions in different types of farming systems.

3. Strengthen Conservation Compliance Measures and Institute Sodsaver Measures

Conventional row crop operations subsidized through Farm Bill commodity programs have been identified as systems with relatively large levels of net GHG emissions. USDA should take immediate steps to ensure more effective enforcement of existing conservation compliance measures for controlling soil erosion.

USDA should use existing authority to protect existing grasslands, particularly native prairie and other ecologically important grasslands by requiring that newly cultivated land not receive crop insurance

benefits without actual production history. Many of these grasslands are in areas with high erosion levels when perennial cover is removed. USDA should conduct outreach and education to inform farmers about the difficulties of meeting conservation compliance requirements for soil erosion in these regions. Legislative measures should be considered to ensure that public funding is not used to promote the cultivation of grasslands for subsidized crop production with the resulting massive loss of carbon soil.

4. Emphasize Sustainable Agriculture Systems in USDA Research Programs

a. Focus climate change research efforts on whole-farm systems.

Given the range of uncertainty about the specific impacts of climate change on agriculture in any given location, adaptation strategies should not be viewed as a set of single practice prescriptions. Resilience in agricultural systems is a function of the health of the agricultural ecosystem. It is therefore essential that strategies for adaptive response to climate change focus on *whole-system* approaches, as opposed to piecemeal components. Small changes in an otherwise vulnerable system may provide some benefit but fail to be sufficiently adaptive. We strongly encourage USDA to emphasize "sustainable systems for agricultural production," and not just "sustainable practices" in its research, education and extension activities concerning climate change.

b. Increase the capacity of the SARE program to meet the challenges of rapid climate change with elements of the SARE program incorporated into USDA's Climate Change Strategic Plan for Research, Education and Extension.

Since 1988, the Sustainable Agriculture Research and Education (SARE) program has been at the forefront at USDA in developing and disseminating the knowledge and tools necessary for the adoption and advancement of sustainable agriculture. Over its 20 years of operation, the SARE program has been highly successful in building the knowledge and tools necessary to promote sustainable agriculture, and in getting that knowledge and tools into the hands of farmers and ranchers. In many cases, producers themselves have been involved in developing and conducting research and education, adding a practicality to the outcomes that is yet to be matched in other USDA programs. In addition, regional councils guiding the program have addressed region-specific questions, which in the face of climate change will be highly valuable, as different regions are expected to face different climate challenges.

We strongly encourage USDA to dramatically ramp up funding for SARE to incorporate climate change mitigation and adaptation into the SARE program. This funding should be targeted both to long-term systems research and more immediate on-farm research, demonstration and outreach based on SARE-developed systems that save energy, reduce GHG emissions and build healthy soils. We also recommend that USDA, in developing a strategic plan for addressing climate change in Research, Education and Extension, build upon the programmatic elements of SARE. These elements have made SARE a success at translating research into outreach, education and adoption of sustainable farming systems by farmers and ranchers.

c. Support climate change research on sustainable and organic production systems.

Additional support for sustainable and organic research, education, and extension is critical to maximizing agriculture's role in mitigating climate change and ensuring that U.S. agriculture can remain resilient in the face of anticipated climate change scenarios (increasing frequency of extreme weather events, unpredictable weather patterns, increasing temperatures, etc.). Conventional agriculture as currently practiced is a net source of GHG emissions and is highly susceptible to

changes in weather, but emerging research on sustainable and organic production systems is showing that these production systems can provide CO2 sinks deep into the soil profile. They are also more resilient in the face of variable and extreme weather events. Developing, improving, and fostering the widespread adoption of sustainable and organic production systems will require significant research, education and extension investments.

Greater efforts should be made to promote sustainable and organic agriculture as a system of production that can build soil health, lower fossil fuel energy inputs and thereby lower GHG emissions from agriculture. More research will improve sustainable and organic systems so that tillage carbon losses and fossil fuel use can be lowered even further. Major funding increases or redirection should be made to pursue these lines of inquiry through the Agricultural Research Service and through National Institute for Food and Agriculture competitive grant programs. Particular attention should be given to ensure the continuation of existing research and establishment of new research that includes long-term comparative studies of farming and cropping systems and of systems for livestock and poultry production.

d. Use full life cycle analysis when comparing animal agriculture systems

USDA should develop and use full life cycle analysis for GHGs and for resilience issues when comparing livestock and poultry production systems. This is especially important when comparing pasture or grassland systems versus confined animal feeding operations in which feed is primarily from grains produced in cultivated cropping systems. By ignoring or discounting the comprehensive analysis of the feed production side of livestock and poultry production, USDA could miss measuring the actual GHG emissions from the whole system.

This same issue arises in comparisons of energy use and GHG emissions. In many regions of the U.S. confined livestock and poultry systems must be cooled in the summer and/or heated in the winter. Many of these confined systems depend on fossil fuel sources for heating and cooling. The GHG emissions from these fuels should be included in the overall GHG comparisons.

e. Increase research resources for the development of publicly available seeds and animal breeds adapted to regional climate regimes.

The scientific consensus is that climate change will result in rapid and unpredictable changes in the growing regimes for crops and forages and conditions for animal agriculture that may vary on a regional basis. The development of publicly available seeds and breeds suited to a variety of local climate conditions will be critical to farmers and ranchers in coping with climate change. A major factor in the resilience of sustainable and organic agricultural systems will be plant varieties and animal breeds that are selected to perform under specific local climate conditions, forage availability, and pest regimes. As local climate conditions change, the availability of a diversity of plant and animal genetic resources will be needed to address the growing challenges of global climate change, increasing pest and pathogen pressure, food security, and safety and resiliency concerns.

Therefore, ensuring the access to the greatest diversity of germplasm resources, and the capacity to develop adapted seed and breed varieties is crucial to resiliency of farm and ranch systems. A major recommitment is required to bolster funding for classical plant and animal breeding through the Agricultural Research Service and the Agriculture and Food Research Initiative competitive grants program. Additional specific recommendations to USDA on incorporating a seeds and breeds initiative throughout its research programs is provided in the National Sustainable Agriculture Coalition's position paper on Seeds and Breeds, available at http://www.sacdev.org/wp-content/uploads/2008/10/seedsbreeds2005.pdf.

5. Design USDA Energy Programs Based on Current, Rigorous Scientific Research that Meet the Needs of Farmers, Ranchers and Rural Communities

a. Rural Energy for America Program (REAP)

USDA should fully utilize the Rural Energy for American Program, which offers critical grants and loans to farmers and business who want to conserve energy. Non-profit organizations with experience in outreach and education to farmers and ranchers on energy issues should be included as entities under REAP eligible to provide farmers and ranchers with assistance on preparing energy audits and establishing renewable and energy efficient systems that can reduce net GHG emissions from agricultural production. Emphasis should be given to low carbon on-farm energy resources, especially small wind and solar technologies.

In addition, categories of projects eligible for REAP funding should be subjected to a comprehensive life-time assessment of GHG emissions. REAP funding should not be used to fund single components of farming systems which overall emit large amounts of GHGs through high fossil fuel energy use or reliance on inputs which generate high levels of GHGs..

b. Biomass Crop Assistance Program (BCAP)

BCAP provides incentives to farmers to provide bioenergy feedstocks in projects with bioenergy refineries to provide the next generation of bioenergy, including cellulosic biofuels. Farmers are provided with financial incentives to establish new bioenergy crops in keeping with a conservation plan to protect wildlife, water, air and other natural resources. If BCAP is reauthorized and funded, USDA should implement this program to ensure that the highest priority is given to projects that involve the establishment of perennial feedstocks with a high potential to reduce GHG emissions. Projects with the highest potential to increase carbon sequestration involve the establishment of perennial crops or trees on land that is currently in row crop production. In addition, projects that incorporate resource-conserving systems have a potential to achieve relatively high levels of carbon sequestration. In addition sustainable biofuel feedstock systems that incorporate leguminous feedstocks or new crops that break up pest cycles can also help lower the level of GHGs emitted from synthetic fertilizer and pesticides.

The BCAP provides financial incentives for biomass collection, harvest, storage and transportation, including funding to remove crop residues. Recent research by USDA Agricultural Research Service scientists and others have raised concerns about the long-term or widespread use of crop residues for energy biomass. The research indicates that residue requirements necessary to increase carbon soil sequestration are likely to be significantly higher than levels required for erosion control. USDA should conduct and support the research needed to make prudent, scientifically valid choices about which agricultural feedstocks are appropriate for biomass energy in light of the overall GHG emissions from their production and their use for bioenergy feedstocks. This assessment should include increases that are related to diverting the feedstocks from other uses, including the retention of residues an agricultural production system to increase soil carbon sequestration.

USDA should expand development of existing crops, discover and develop unconventional crops, and create and deploy advanced cropping systems that exploit the potential of all crops so that biomass production can be expanded to provide a sustainable supply of cellulosic feedstock without reducing soil organic matter, a critical component of the productive capacity of the soil.

CONCLUSION

The National Sustainable Agriculture Coalition supports an immediate and environmentally beneficial transition to a resilient agri-food production system based on sustainable agricultural systems and practices. We call upon Congress and federal agencies, especially USDA, to prioritize sustainable agriculture systems and policies that enable farmers, ranchers and rural communities to address through a variety of mechanisms the challenges posed by a changing climate.

The Coalition and its members believe that it is possible and necessary to begin building this resilient agricultural system, employing sustainable practices, immediately. We also believe that implementing sustainable practices will be affordable and cost-effective, and that higher energy costs affecting all parts of the farm system make these shifts to sustainable agriculture essential.

Climate change poses a serious threat to our environment, our rural communities, our farmers and ranchers, and the millions of Americans who rely on them for food and fiber. Shifting to a more resilient, sustainable agricultural system will mitigate climate change while building an agri-food system that is better for our planet and its people. Failing to do so will result in devastating consequences for agriculture and the environment.

For additional information, contact the National Sustainable Agriculture Coalition:
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APPENDIX. SUSTAINABLE AGRICULTURE SYSTEMS THAT MITIGATE CLIMATE CHANGE

Biological nitrogen fixation
The conversion of molecular nitrogen (N_2) to ammonia (NH_3) through biological fixation by bacteria begins the process of making nitrogen available to plants. Once this "fixed" nitrogen is incorporated into the plant biomass, it can become part of the soil reservoir and taken up again by plant roots as nitrate (NO_2). Biological nitrogen fixation allows nutrients in soil to be actively cycled in the ecosystem, rather than relying on throughflow of nutrients to nourish plants.

Conservation tillage
Conservation tillage refers to strategies and techniques for establishing crops in the previous crop's residues, which are purposely left on the soil surface. The principal benefits of conservation tillage are improved water conservation and the reduction of soil erosion. Additional potential benefits include reduced fuel consumption, planting and harvesting flexibility, reduced labor requirements, and improved soil tilth (NCAT/ATTRA).

Crop residue management
Crop Residue Management refers to any tillage method that leaves crop residue on the surface to reduce erosion. Crop residue left on the surface shields the soil from rain and wind until emerging plants provide a protective canopy. Crop residue also improves soil tilth and adds organic matter to the soil. Less tillage reduces soil compaction and saves farmers time and fuel.

Integrated pest management
Integrated pest management (IPM) is an effective and environmentally sensitive approach to pest management that uses current, comprehensive information on the life cycles of pests and their interaction with the environment to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

Manure Composting
Composting is the aerobic decomposition of organic matter by certain microorganisms. These microbes consume oxygen and use nutrients including carbon, nitrogen, phosphorus, and potassium as they feed on the organic matter. The resulting composted manure is a humus-like organic material, fine-textured, low-moisture, and with a non-offensive earthy odor. If high enough temperatures have been reached during the composting process, pathogens and weed seeds have been killed.

Nutrient management
Nutrient management is the practice of using nutrients wisely for optimum economic benefit, while minimizing impact on the environment. Proper application of plant nutrients help achieve optimum crop yields; while improper application can lead to water quality problems.

Organic agriculture
Organic agriculture is a system of agriculture that uses crop rotation, green manure, compost, biological pest control, and mechanical cultivation to maintain soil productivity and control for pests. Organic agriculture does not use synthetic fertilizers or pesticides, plant growth regulators, livestock feed additives or genetically modified organisms.

Polyculture and crop rotation
Polyculture is the practice of growing multiple crops in the same space, as crops would grow in a natural ecosystem. Polyculture includes techniques such as crop rotation (growing different crops in the same area in sequential seasons), multi-cropping (growing different crops simultanneously), and inter-cropping (growing different crops in between rows of a primary crop). Crops grown in this way are less susceptible to disease than monoculture crops, and also increase local biodiversity.

Resource conserving crop rotation
As defined in 2008 Farm Bill at Section 1238G, resource-conserving crop rotation includes at least one resource conserving crop, reduces erosion, improves soil fertility and tilth, interrupts pest cycles, and in applicable areas, reduces depletion of soil moisture, or otherwise reduces the need for irrigation.

Restoration of degraded soils
Soil restoration seeks to minimize the degradation of soil as a resource that takes hundreds of thousands of years to form, and to promote functional plant-soil systems. Returning soils to their original state as soon as possible after disturbance, stopping application of chemicals, using bacteria to break down pollutants, and applying cover crops are all ways to help restore degraded soil. Without soil restoration, soil erosion and loss of soil organic matter and nutrients damage agricultural outputs in addition to the larger ecosystem.

Rotational grazing
Rotational grazing is periodically moving livestock to fresh paddocks, to allow pastures to regrow. Feed costs decline and animal health improves when animals harvest their own feed in a well-managed rotational grazing system (NCAT/ATTRA).

Seeds and Breeds
The concept of "Seeds and Breeds" refers to the maintenance of genetic resources of plant varieties and animal breeds that are necessary for the survival of sustainable and organic agricultural systems for current and future generations.

Water management
Sustainable agriculture strategies for conserving water include converting cropland to managed grassland in riparian areas, constructing and restoring wetlands, measuring and conserving irrigation water, creating conservation easements, choosing water-efficient crops and resource-conserving crop rotations, and limiting the impact of nitrogen and pesticide runoff from farms into local water supplies. Water management strategies for maximizing carbon sequestration include monitoring soil organic carbon and soil inorganic carbon pools and sediments affected by erosion processes, irrigation, drainage, and sub-irrigation.