



The Global Plant Council

Convening Motion:

That we as representatives of plant science societies of the world formally establish a Global Plant Council to discuss and collaborate on solutions to global issues that impact the future of our world and humanity.

Purpose Statement.

The Global Plant Council is a coalition of plant science societies of the world that brings plant scientists together to work synergistically toward solving the pressing problems facing humankind and that speaks with a strong voice from a plant science perspective to inform the global debate on those problems.

Mission Statement

In recognition of the central importance of plants to humanity and the world, plant science societies have come together to establish the Global Plant Council (Honolulu, HI, July 18, 2009). The mission of the Council is to define and engage in coordinated strategies that impact the most critical issues facing humankind and to increase awareness of the central importance of plant science in addressing these issues. Our shared vision and effort will enable more effective use of knowledge and resources, accelerating progress in solving the challenges of world hunger, energy, climate change, health and well-being, sustainability and environmental protection.

Tagline

Plant research to save the planet

Preamble

The Global Plant Council recognizes that to effectively solve or mitigate the pressing global problems we all face requires the inclusion of a plant science based approach, and therefore a voice for plant scientists in the global debate about how to address these problems. Bringing together the plant science societies of the world enables the Council not only to access the remarkable scientific talent that exists in plant biology across the globe but also to incorporate region specific viewpoints on how global issues impact specific societies and cultures. A major aspect of what the Council hopes to achieve is to bring the world's plant science practitioners into the discussions from which science-based policies will emerge and into critical areas of ongoing decision-making. The Council, while placing a strong emphasis on the plant science aspects of global issues, also highly values partnerships with other disciplines, consultation with policy makers and other entities in the global society that have an interest in tackling and solving the major problems facing humankind: world hunger, human health and well-being, global climate change, energy and biomaterials, and sustainability and environmental protection. The Council also understands the critical need to effectively inform the global community regarding the central importance of the plant sciences and of the value of generating reason based strategies for innovative solutions to the pressing global issues.



Pressing Global Problems that the Global Plant Council Will Address

World Hunger

Presently more than one billion people are going hungry, and the resulting malnutrition is contributing to disease and mortality. By 2050 we will need to produce at least twice as much food as we do today to meet the demands of the growing world population. At the same time, world commodity storage is at historically low levels (e.g., early in the 21st century the world has less than a one-month supply of wheat), and usable land for agriculture is being lost to urbanization and soil degradation. The world relies on ten major crops to provide 95% of the food consumed by humans and domestic animals. Increasingly, climate change and water shortages are threatening the crops we are growing today. Landraces and wild relatives of all major crops are disappearing rapidly, removing important productivity and yield traits from the usable global gene pools.

Therefore, plant biologists must use their knowledge, technologies and genetic resources to enable the development of new crops and improve existing crops that have higher yields and tolerance to pest, pathogens, drought and other environmental stresses. Plant biology is uniquely equipped to help achieve the sustainable increases in yield that must be accomplished while using less water, fertilizer, and energy.

Health and Well-being

Human health is dependent upon a balanced diet in which plants have an essential role, not only directly but also through the animal products we consume. However, staple food crops like rice are poor sources of essential nutrients such as vitamins A, C, and E, iron, and zinc.

Approximately one-third of the world's population suffers from poor nutrition because their diet relies heavily on a single staple crop or because of a scarcity of food. Impacts include loss of eyesight, illness, increasing susceptibility to disease, and dramatically increased child and adult mortality. For example, 500,000 children every year are losing their eyesight from vitamin A deficiency, of which half die within a year. The nutritional value of staple foods must be enhanced and the breadth of crops that serve as the staple contribution to the human diet must be expanded. Plant biologists have an essential role in these endeavors and must contribute on a global level.

Certain foods derived from plants can result in allergenic reactions, such as gluten-intolerance. Bacterial and fungal contamination of food before and after it is harvested can lead to massive losses and potential health risks. Plant biologists must facilitate the development of crops that lack allergens and alleviate these problems as well as methods for safely storing and maintaining the nutritional value of harvested crops.

Over one billion people world-wide are obese, and obesity-related illnesses, such as diabetes and cardio-vascular disease, are major health problems. Developing plants and foods that contribute beneficial nutrients, such as anti-oxidants, and healthier types of oils and starches can help to address obesity related illnesses. Public education regarding healthy diets that provide sufficient calories while achieving high-quality balanced nutrition is an important compliment to research.

Plants have been used for millennia as sources of medicines, and each species has its own unique complement of such compounds. Plant biologists provide an understanding that is essential to maintain natural ecosystems and preserve diversity in ways that benefit all humanity. Plant biologists *can* facilitate the discovery and sustainable development of new and existing bioactive compounds from different plants within the context of ethical use and protection of biodiversity.

Climate change

We are facing unprecedented climate change due to the buildup of carbon dioxide and other greenhouse gases in the atmosphere. Through the process of photosynthesis, plants remove carbon dioxide from the atmosphere. There are a number of strategies that could be employed to increase the capacity of plants to absorb carbon dioxide and convert it to terrestrial and oceanic biomass, thus mitigating climate change. *These strategies can be designed such that food security is not affected.*

A key goal for climate change management is to reduce net carbon dioxide emissions. Agricultural systems are both sinks and sources of such emissions. Plant biologists can contribute to development of new crop varieties for low input, high yield agriculture through breeding and technological innovations. Such crops will both enhance carbon dioxide uptake and decrease total carbon dioxide emissions. With better understanding of the mechanisms of light energy capture (photosynthesis) and conversion to biomass, plant biologists can contribute to development of new plant-based low carbon (clean) energy sources.

Climate change will result in changes in geographical climatic zones, more extreme weather events and unpredictable conditions for plant growth, particularly in areas that are already challenged for food production. Plant biology has an essential role in the development of crop varieties that exhibit improved water use efficiency and other traits that allow stable performance over a range of environmental conditions.

Energy and Biomaterials

Much of the increase in carbon dioxide in the atmosphere and the resultant climate change is derived from the burning of fossil fuels, which are a limited and nonrenewable resource. Biomass can be used and further developed as an alternative source for energy and industrial materials that do not increase greenhouse gas concentrations. Plant biologists can facilitate the development of sources of bioenergy and biomaterials that do not limit food production. Plant biology offers novel solutions for bioenergy/biomaterials. Such solutions include the design and manufacturing of more efficient solar energy harnessing devices based on photosynthetic processes in plants and algae, more efficient use of currently existing biomass, development of dedicated bioenergy/biomaterials crops that exhibit improved nutrient and water use efficiencies, optimized plant architecture, and altered composition to facilitate conversion to biofuel and biomaterials. The establishment of bioenergy/biomaterials useful plants and algae that are tolerant of stresses and can be grown on areas that are marginal for food production has to be explored as we pursue sustainable agricultural and aquacultural strategies.

Sustainability and Environmental Protection



It is clear that the use of our planet's natural resources for food, feed, fiber, and energy production as currently practiced is not a sustainable enterprise on the global scale. Sustainable use of natural resources for the benefit of humankind must encompass environmental, economic and social perspectives. Accomplishing these objectives will require the development of a combination of strategies, technologies, and decision-making tools for the responsible stewardship of land, water, and energy in ways that maintain or enhance the environment. This can only be achieved by the combined efforts of plant scientists and those from other disciplines in consultation and collaboration with policy makers and the public at large. Plant biologists offer a unique perspective on the key issues of the identification, use, protection and regeneration of biodiversity and genetic variation in natural and managed environments. In addition, plant biologists provide critical input for the development of region-specific approaches towards land use, sustainability, and the sharing of expertise, technologies, and plant resources.