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Norman Uphoff, Professor Emeritus of Government and International Agriculture at Cornell University and senior advisor to the SRI International Network and Resources Center (SRI-Rice) at Cornell University

Created in partnership with The Agropolis Fondation, a French scientific foundation supporting research and education in agricultural sciences and sustainable development, Olam launched the \$50,000 Olam Prize for Innovation in Food Security in 2014. The prize is awarded to projects that show outstanding innovation to achieve an impact on food security.

In 2015, Olam awarded the inaugural prize to Professor Norman Uphoff and the SRI International Network and Resources Center (SRI-Rice) at Cornell University. Uphoff is former director of the Cornell International Institute for Food, Agriculture, and Development. SRI-Rice was founded in 2010 to support further development and dissemination of the System of Rice Intensification (SRI) synthesized in Madagascar over 30 years ago.

Q: Why is the System of Rice Intensification significant?

Over 3 billion people, most in developing countries, depend on rice for about 20% of their daily calories. SRI methods greatly increase the productivity of the land, labor, capital and water that farmers use in rice cultivation. SRI introduces simple changes in farming practices: wetting and drying fields instead of flooding them continuously; adding more organic matter to the soil to improve its structure and functioning; greatly reducing plant density. Yields are increased by 20-50%, sometimes more, and production costs are lowered. In most of Asia, SRI methods even become labor-saving! By suitably adapting SRI ideas and practices, similar benefits are being achieved for wheat, finger millet, maize, legumes, and even some vegetables.

Q: What makes SRI innovative?

SRI practices bring out more fully and economically the genetic potentials that already exist in rice and other crop plants. SRI has sometimes been dismissed as 'low-tech.' but its effects can be explained by cuttingedge research in soil ecology, microbiology, epigenetics, and plant physiology.

Much of the impact of SRI methods can be attributed to the impact it has on increasing the growth and capability of root systems and the abundance and diversity of the soil biota. The science and practice of the Green Revolution unfortunately overlooked the roles of both root systems and the soil biota. SRI ideas and techniques are open-source and free for anyone to use and adapt. They are starting to be applied to large-scale, mechanized farming while helping small-scale, subsistence farmers become more food secure.

A key part of SRI is improving soil systems' fertility by boosting their populations of microorganisms. Beneficial bacteria and fungi live around, on, and even inside plants, much as we human beings are massively and beneficially inhabited by the human microbiome. Microbial endophytes living symbiotically within plant cells can affect plants' genetic expression, up-

We are just beginning to understand these processes. For example, we regularly observe in the field that young seedlings given the right conditions (widely spaced in soil, kept moist but unflooded, aerobic, and well-supplied with organic matter) grow into plants more waterefficient, better able to take up nutrients that photosynthesize more carbohydrates per unit of water transpired. In supportive environments, given genotypes can produce better, more robust phenotypes.

regulating and down-regulating certain genes.

Our approach to research is innovative, too. As a rule, research is carried out in laboratories or research stations and once validated the technology is transferred to farmers. SRI researchers use a more interactive approach, carrying out the science and working with the farmer in parallel, with each informing the other. Our emphasis is on adaptation rather than 'adoption,' expecting and inviting farmers to do their own experimentation and evaluation, adjusting specific practices to their local conditions.

Q: Why did you enter the Prize?

My colleague saw the announcement and suggested that we enter. We felt that SRI would be supportive of the Olam Prize's focus on the UN's Sustainable Development Goal #2: "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture." We liked

the Prize's focus on innovation and welcomed the opportunity to put SRI before a highly-qualified international jury. The application process was also very straightforward.

Q: Why do you think you won?

I guess because SRI was a good fit with the Prize's criteria. Our approach is indeed innovative, and SRI clearly contributes to food security and crop resilience, e.g. drought-resistance. It improves food accessibility and affordability by increasing yields and lowering cost.

Q: What difference has winning the Prize made to the SRI project?

The proceeds from the Prize have enabled us to strengthen our SRI research network. This connects hundreds of researchers who are working on various aspects of understanding SRI and making scientific findings more widely known and available. Thanks to electronic media, members can easily see who else is working on problems or tasks that interest them. We at Cornell put researchers in touch with one another to promote communication and collaboration.

We have created and curated a database of published research on SRI with over a thousand publications from over 30 countries. For example, we post English translations of abstracts of studies, including hundreds of publications in Chinese. In the future, we want to expand our editorial assistance for non-English-speaking researchers, to help them get their work published in good English-language journals, which would greatly expand SRI knowledge and use around the world. We would also like to run a competitive grants program for students to support SRI fieldwork and training.

Q: What is your advice to someone applying for the prize?

The prize focuses on innovation, so you need to emphasize this in your application: what do you bring that is new, and how can it be extended into the future? It's important to show how your project meets the criteria of food security, which Olam describes as the four A's: availability, affordability, accessibility, and adequacy.

Could your research feed the world?

- Is your research project the next game-changer for agriculture?
- Will your innovation help feed 8.5 billion people by 2030?
- Would US\$50,000 help scale its impact?

Apply online at www.agropolis-fondation.fr/uk/ our-actions/Malassis-Prize.html or search 'Olam Prize' Deadline for applications is 11:59pm CET (France) 25th January 2017

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Agropolis Fondation is a French scientific foundation established in 2007 to promote and support high-level research and higher education as well as to broaden international research partnerships in agricultural sciences and sustainable development research. In addition to the Olam Prize, Agropolis Fondation awards the Louis Malassis International Scientific Prize for Agriculture and Food.

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