

**FAO Expert Workshop on**  
**"Perennial Crops for Food Security"**  
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**From Genetics & Breeding to Agronomy to Ecology**

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**Abstract**

With annual grain monocultures, we have frequent clearcutting of crop root systems; as a result, ecosystem processes below the soil surface cannot sustain themselves in a healthy state. Each year, we disrupt this rich ecological resource, which otherwise could have been contributing to high, stable grain yields. The science of agronomy arose out of the necessity to cope with such a compromised landscape and make up for lost ecological processes. But we are severely limited in what we can accomplish with the "software" we call agronomy as long as we are saddled with the deficiencies of the annual crop species that serve as our "hardware". Once perennial grain-producing species become available, however, restored soil ecosystems can contribute to food production, while much of the landscape-repair work that we now call upon agronomy to provide will not be necessary. Perennial hardware will open up innumerable possibilities for bringing new ecological software into agriculture. An example is provided by the potential development of perennial sorghum for sub-Saharan Africa. To date, perennial sorghum breeding has occurred solely in North America. When those breeding populations begin to be evaluated in diverse African environments, selection for proper adaptation will be essential. Once that is accomplished, an interim objective may be to develop a "super-ratooning" sorghum. But in the longer term, a true perennial growth habit will make possible whole new farming systems that combine sorghum with perennial food legumes and other crops. We can make such systems productive and ecologically sound without resorting to many of the agronomic interventions that annual grain crops require.

**The potential of perennial crops for sustainable agriculture**

***Stan Cox***

**Abstract**

Before launching into a discussion of policies and practices that can make perennial grain crops a reality on the ground, it will be helpful to review briefly the main points made in previous sessions regarding the current state of development of perennial grains, prospects for further improvement, and the kinds of agroecosystems in which perennial grains might be grown.