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Organic Cover Crops Benefits from Farming Practices

Termon Teh*

Agriculture Department, University of agriculture makurdi, Makurdi, Nigeria

ABSTRACT

In agriculture, cover crops are plants that are planted to cover the soil rather than for the purpose of being harvested. Cover crops manage erosion, soil fertility, soil quality, water, weeds, pests, diseases, biodiversity and wildlife in an agro ecosystem-an ecological system managed and shaped by humans. Cover crops could also be an off-season crop planted after harvesting the crop. They may grow over winter. Although cover crops can perform multiple functions in an agro ecosystem simultaneously, they're often grown for the only purpose of preventing erosion. Soil erosion is a process that can irreparably reduce the productive capacity of an agro ecosystem. Cover crops reduce soil loss by improving soil structure and increasing infiltration, protecting the soil surface, scattering raindrop energy and reducing the velocity of the movement of water over the soil surface. Dense crop stands physically hamper the speed of rainfall before it contacts the soil surface, preventing soil splashing and erosive surface runoff. Additionally, vast cover crop root networks help anchor the soil in place and increase soil porosity, creating suitable habitat networks for soil macro fauna. It keeps the enrichment of the soil good for subsequent few years. In agriculture, cover crops are plants that are planted to cover the soil rather than for the purpose of being harvested. Cover crops manage erosion, soil fertility, soil quality, water, weeds, pests, diseases, biodiversity and wildlife in an agro ecosystem-an ecological system managed and shaped by humans. Cover crops could also be an off-season crop planted after harvesting the crop. They may grow over winter. Although cover crops can perform multiple functions in an agro ecosystem simultaneously, they're often grown for the only purpose of preventing erosion. Soil erosion is a process that can irreparably reduce the productive capacity of an agro ecosystem. Cover crops reduce soil loss by improving soil structure and increasing infiltration, protecting the soil surface, scattering raindrop energy and reducing the velocity of the movement of water over the soil surface. Dense crop stands physically hamper the speed of rainfall before it contacts the soil surface, preventing soil splashing and erosive surface runoff. Additionally, vast cover crop root networks help anchor the soil in place and increase soil porosity, creating suitable habitat networks for soil macro fauna. It keeps the enrichment of the soil good for subsequent few years.

Keywords: Plant genetics; Plant nutrition; Genetic variations in plants

Introduction

Plant genetics is that the study of genes, genetic variation, and heredity specifically in plants. It is generally considered a field of biology and botany, but intersects frequently with many other life sciences and is strongly linked with the study of data systems. Plant genetics is analogous in some ways to animal genetics but differs during a few key areas.

Plants, like all known organisms, use DNA to expire their traits. Animal genetics often focuses on parentage and lineage, but this will sometimes be difficult in plant genetics thanks to the very fact that plants can, unlike most animals, be self-fertile. Speciation is often easier in many plants thanks to unique genetic abilities, like being well adapted to polyploidy. Plants are unique therein they're ready to produce energy-dense carbohydrates via photosynthesis, a process which is achieved by use of chloroplasts. Chloroplasts, just like the superficially similar mitochondria, possess their own DNA. Chloroplasts thus provide a further reservoir for genes and genetic diversity, and an additional layer of genetic complexity not found in animals.

So how can plant physiology research help achieve the grand challenge? Taking a reasonably restrictive view of what constitutes physiology research, we'd consider each of the three traditional areas of physiology research: (i) metabolism (including nutrition); (ii) growth and development (vegetative and reproductive); and (iii) response to the environment. Each of those is a neighborhood of active work where breakthroughs could end in progress toward societal needs, and a partial list (and admittedly biased) of specific challenges and opportunities.

The development of novel methods to form plant breeding more efficient and effective receives tons of attention of both public and personal researchers. Cisgenesis has been operationalised at Wageningen University on crops like apple and potato; private Dutch companies are at the forefront of the event of the gene editing technology ODM and of reverse breeding. Having such a big knowledge domain within the country helps to stir the general public debate round the use of such innovations in plant breeding. The government sponsored

***Corresponding author:** Termon Teh, Agriculture Department, University of agriculture makurdi, Makurdi, Nigeria; E-mail: termon97@gmail.com

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programme to develop resistance management strategies for potato blight Phytophthora infestans through cis-genesis also included a task for the university to support a debate around the project. The project created an alternate to the currently used fungicides (up to 16field sprays per season). Furthermore, through the stacking of resistance genes, it showed a vision towards sustainable resistance management. This resonated well with the public.

Plant mutagenesis is rapidly coming aged within the aftermath of recent developments in high-resolution molecular and biochemical techniques. By combining the high variation of mutagenized populations with novel screening methods, traits that are almost impossible to spot by conventional breeding are now being developed and characterized at the molecular level. This paper provides a comprehensive overview of the varied techniques and workflows available to researchers today within the field of molecular breeding, and the way these tools complement those already used in traditional breeding. Both genetic (Targeting Induced Local Lesions in Genomes; TILLING) and phenotypic screens are evaluated. Finally, alternative ways of bridging the gap between genotype and phenotype are discussed.

The goal in mutagenesis breeding is to cause maximal genomic variation with a minimum decrease in viability. Among the radiation-based methods, γ-ray and fast neutron bombardment now supersedes X-ray in most applications. Of these, γ-ray bombardment is a smaller amount destructive causing point mutations and little deletions whereas fast neutron bombardment causes translocations, chromosome losses, and enormous deletions.