

Climate Smart Farming through Pulse Cultivation

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Abstract—Pulses are the boon of nature and the most sustainable crops a farmer can grow. The crop takes little water to produce same biomass, compared with other field crops results in low energy use. Pulses are affordable source of protein and amino acids to vegetarian people; provide a number of nutritional benefits (with zero cholesterol and low saturated fat) and the 2nd important constituent of Indian diet after cereals. Pulses provide raw material to various small industries (dal, chhatu, roasted grain, papad industry, etc.). They can supply additional fodder for cattle. Some pulses are turned under the soil surface as green manure crops. Pulses being legumes fix atmospheric nitrogen into the soil, thus help to reduce use of synthetic fertilizers and release of greenhouse gases. They play important role in crop rotation, mixed and intercropping, and they help to maintain the soil health and fertility. They add organic matter into the soil in the form of leaf mould. Pulse crops produce a number of different compounds that feed soil microbes and help to maintain soil health, thus, they have a significant impact on soil biology, increasing soil microbial population and activity even after the harvest. Pulses have also been shown to exude greater amounts and different types of amino acids than non-legumes and the plant residues left after harvesting have a different biochemical composition (e.g. better Carbon : Nitrogen ratio) than other crop residues. Crops' performance is better in soils that are more "alive" with a diverse array of soil organisms, as these organisms break down and cycle nutrients more efficiently, feeding the crops as they grow. In addition, a large, diverse population of soil organisms acts to 'crowd out' non-beneficial disease-causing microbes, making for healthier plants. Growing pulse crops in rotation with other crops enables the soil environment to support these large, diverse populations of beneficial soil organisms. The ability of pulses to feed the soil different compounds has the effect of increasing the number and diversity of soil microbes. They are helpful for checking the soil erosion as they have more leafy growth and close covering. Pulse crops can better withstand climate change; can be grown on almost all types of soil and climatic conditions, thus can reduce the risk for the smallholder farmers. With the introduction of improved varieties and promotion of best management practices, pulse crops can continue to be an excellent choice for farmers to maintain the ecology by lowering the carbon and water footprint.
