

PRODUCTIVITY AND PROFITABILITY OF THE TRANSGENIC COTTON–WHEAT PRODUCTION SYSTEM THROUGH PEANUT INTERCROPPING AND FYM ADDITION

By RAMAN JEET SINGH†, I. P. S. AHLAWAT and KULDEEP KUMAR

Division of Agronomy, Indian Agricultural Research Institute (IARI), New Delhi 110 012, India

(Accepted 4 February 2013; First published online 1 March 2013)

SUMMARY

The cotton–wheat production system (CWPS) occupies an important place in the agricultural economy of several South Asian countries. The instability of the CWPS has increased particularly during the post-transgenic hybrids phase mainly because of these hybrids calling for intensive crop management being cultivated under all situations, especially in resource-poor conditions leading to violent fluctuations during adverse years and thereby affecting the socio-economic status of these developing countries. A study was conducted to evaluate and quantify the effect of the two-tier intercropping of cotton and peanut with the substitution of a 25–50% recommended dose of nitrogen (RDN) of cotton by farmyard manure (FYM) on productivity, profitability and nitrogen economy in the CWPS at New Delhi during 2006–08. To quantify the residual effects of previous crops and their fertility levels, a succeeding crop of wheat was grown with varying rates of nitrogen, viz. 0, 50, 100 and 150 kg ha⁻¹. Wheat equivalent productivity was significantly more with the inclusion of peanut in the CWPS (21–26%) with a high net return (US\$288) than a pure stand of cotton in the CWPS. The substitution of 25% RDN of cotton by FYM being on par with no substitution recorded a higher wheat equivalent yield, nitrogen, phosphorus and potassium uptake, net return and nitrogen use efficiencies. Nitrogen economy in wheat was 22 kg ha⁻¹ due to inclusion of peanut in the CWPS and 13 kg ha⁻¹ due to substitution of the 25% RDN of cotton by FYM. The study suggested that for the success of the CWPS in South Asian countries, escalating prices of N fertilizers with environmental issues and the instability of transgenic hybrids can be overcome by using wider rows of cotton by peanut intercrop with the integrated use of both organic and inorganic sources of nitrogen.

INTRODUCTION

Cotton–wheat is a long established crop production system of the north-western plains of India and Pakistan, and it occupies an important place in the agricultural economy of both the countries. While cotton is a cash crop, wheat provides the necessary food security. In India, the cotton–wheat production system (CWPS) is followed on 1.40 million hectares and on 2.62 million hectares in Pakistan. Next only to the rice–wheat cropping system, the CWPS occupies around 4.0 million hectares in the north-western states (Punjab, Haryana and Rajasthan) of India and adjoining areas of Punjab and Sindh provinces of Pakistan (Mayee *et al.*, 2008). The economy of the regions where it is cultivated is consistently influenced by its production and processing sectors, and by generating direct and indirect employment to more than 8 million people. There was a