INTEGRATED USE OF ORGANIC AND INORGANIC FERTILIZERS IN WHEAT AND THEIR RESIDUAL EFFECT ON SUBSEQUENT MUNGBEAN

BY

SAJJAD KHAN

DOCTOR OF PHILOSOPHY (Ph.D) IN AGRICULTURE
(AGRONOMY)

DEPARTMENT OF AGRONOMY
FACULTY OF CROP PRODUCTION SCIENCES
THE UNIVERSITY OF AGRICULTURE
PESHAWAR - PAKISTAN
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Approved by:

Prof. Dr. Shad Khan Khalil — Chairman Supervisory Committee

Dr. Amanullah (Jr) — Member (Major Field)

Prof. Dr. Zahir Shah
Department of Soil and
Environmental Sciences — Member (Miner Field)

Prof. Dr. Bashir Ahmad — Convener Board of Studies/Chairman
Department of Agronomy

Prof. Dr. Muhammad Afzal — Dean Faculty of Crop Production Sciences

Prof. Dr. Farhat Ullah — Director Advanced Studies and Research

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Thesis approved by:

EXTERNAL EXAIMINER: _____

Prof. Dr. Jhon G. Mexal
Plant & Environmental Sciences
New Mexico State University

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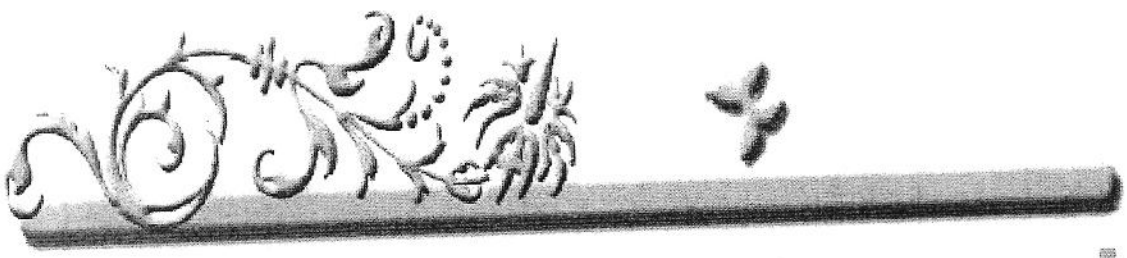
Thesis approved by:

EXTERNAL EXAIMINER: _____

Prof. Dr. Jin Hu
Department of Agronomy
Zhejiang University
Hangzhou—310058
China
jhu@zju.edu.cn



DEDICATION

TO

My teachers from nursery to PhD

SAJJAD KHAN

INTEGRATED USE OF ORGANIC AND INORGANIC FERTILIZERS IN WHEAT AND THEIR RESIDUAL EFFECT ON SUBSEQUENT MUNGBEAN

Sajjad Khan and Shad Khan Khalil

Department of Agronomy, The University of Agriculture Peshawar, Pakistan

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ABSTRACT

Application of organic manure and inorganic fertilizer helps in proper nutrition of wheat and also maintains soil fertility. The aim of the experiment was to investigate response of wheat to the combine use of manures and mineral fertilize for yield, yield components, soil fertility and also to know their residual effect on subsequent mungbean. The combine application of organic manures and inorganic fertilizers on yield and yield components of wheat and their residual effect on subsequent mungbean was studied at Livestock Research and Development Station Surezia, Peshawar in two year filed trials in 2010-11 and 2011-12. the experiment was conducted in Randomized complete block design with four replications. In this experiment three levels of poultry manure (2, 4 and 6 t ha^{-1}) three levels of farmyard manure (2, 4 and 6 t ha^{-1}) and two levels of nitrogen (60 and 90 kg ha^{-1}) along with control were applied to wheat crop. Mungbean was cultivated on the same plots after harvest of wheat without application of any fertilizers to know the residual effect of these fertilizers sources on growth and yield of mungbean. Poultry manure, farmyard manure and nitrogen significantly affected crop growth rate, plant height, leaf area, leaf area index, specific leaf area, leaf area ratio, spikes m^{-2} grain yield, biological yield and harvest index of wheat. Mean values for wheat showed that highest crop growth rate (12.35 g m^{-2} day^{-1}), plant height (103.86 cm), leaf area (134.04 cm^2), leaf area index (4.26), specific leaf area (124.59 cm^2 g^{-1}), leaf area ratio (29.78 cm^2 g^{-1}), spikes m^{-2} (330) biological yield (13372 kg ha^{-1}) and grain yield (4151 kg h^{-1}) was at six t poultry manure, six t farm yard manure ha^{-1}, and 90 kg N ha^{-1} while higher harvest index (33.03 %) was recorded in control plots. Residual effect of the entire organic and inorganic combination also significantly affected CGR, leaf nitrogen content, pod $plant^{-1}$, grains pod^{-1}, biological yield, grain yield and harvest index of mungbean. In case of mungbean highest CGR (21.52 g m^{-2} day^{-1}), leaf nitrogen content (1.99 %), pod $plant^{-1}$(22.40), grains pod^{-1} (10.96), biological yield (7358 kg ha^{-1}), grain yield (992 kg ha^{-1})

and harvest index (13.49 %) were recorded at the residual effect of 6 t poultry manure, 6 t farm yard manure ha^{-1}, and 90 kg N ha^{-1}. The yield response of what and mungbean was highest at high levels of fertlizers. Mungbean rely on the residual fertilizers applied to wheat. The results showed that organic manures and inorganic fertlizers in combine use improved soil fertility in term of % nitrogen, phosphorus and potassium. The ratio of 6 t PM, 6 t FYM ha^{-1} and 90 kg N ha^{-1} is recommended for higher yield in wheat and mungbean should be cultivated on the same field without application of fertilizers.