

Research Paper

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Effect of maize based cropping systems on weed dynamics and crop productivity

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ABSTRACT : A field experiment was conducted during 2010 at experimental farm of AICRP on weed control to study the effect of cropping systems on weed dynamics and crop productivity. The experiment comprised of five different maize based cropping systems in main plot while two treatments *i.e.* weedy and RCP (recommended cultural practices) in sub plot. Significantly highest equivalent grain yield was recorded in the cropping system of maize-chickpea, which was found at par with maize-wheat and maize *Rabi* sorghum system and found significantly superior over rest of the treatments. As regards weed control treatments recommended practice of weed control recorded significantly highest grain yield (equivalent yield of the system) over the control *i.e.* weedy check.

Key Words : Maize based cropping systems, Weed dynamics

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The yield losses caused due to weeds within India are the extent of 37 per cent while insects and diseases account for approximately 22 per cent and 29 per cent, respectively. Today diversity in weed management programme must be integrated and balanced to avoid unsustainable dependence on only one or two tools for example the intensive, expensive and erratic application of herbicides leads to their accumulation in soils to a dangerous level that adversely affects both the quality and biological composition of soils (Srinivas *et al.*, 2008; Zahran, 1999). Such type of programme will includes different cultural, mechanical and agronomic practices including minimizing weed seed production and management of soil weed seed bank. In light of above, this experiment was conducted to study the effect of maize based cropping systems on weed dynamics and crop productivity.

RESEARCH PROCEDURE

The experiment was conducted during *Kharif* and *Rabi* 2010 in split plot design with three replications. The main plot comprised of five different maize based cropping systems *viz.*, maize - wheat, maize - chickpea, maize - *Rabi* sorghum, maize-safflower and maize - pea while in subplots recommended practice *i.e.* 2HW, 1 H at 3 and 6 WAS weedy check treatments were included. The gross and net plot size were 4.5 x 4.5 m and 3.6 x 3.6 m, respectively during both seasons. The spacing

maintained during *Kharif* season for maize was 60x30 cm while during *Rabi* season it was 22.5cm for wheat and was 45 x 15 for chickpea, *Rabi* sorghum, safflower and pea. The recommended dose of NPK and plant protection schedule was followed during both the seasons for respective crops. During *Kharif* 2010 the maize crop was sown on 28.06.2010 and *Rabi* crops were sown on 26.10.2010.

RESEARCH ANALYSIS AND REASONING

The 38 per cent grassy and 62 per cent broad leaved weeds were associated with maize crop during *Kharif* season of 2010. Among broad leaved weeds, dominant weed species were *Euphorbia geniculata*, *Ipomea maxima*, *Digera arvensis*, *Phyllanthus medraspentasis*, *Acalypha indica*, *Abutilon indicum*, *Merremia emerginata*, *Alternanthera sessilis* and *Parthenium hysterophorus*. The dominant grassy weeds were *Brachiaria eruciformis*, *Cynodon dactylon*, *Cyperus rotundus* and *Allotroopsis cimicina*.

The dominant weed species observed in gram were *Euphorbia geniculata*, *Chenopodium album*, *Phyllanthus medraspentasis*, *Digera arvensis*, *Parthenium hysterophorus*, *Cyperus rotundus*, *Brachiaria eruciformis*.

Whereas in wheat dominant weed species observed were *Brachiaria eruciformis*, *Cynodon dactylon*, *Digera arvensis*, *Euphorbia geniculata*, *Parthenium hysterophorus*,