

Experiment No.7

Shift of Weed Flora Study in Long Term Experiment

7.1 Objectives

To study and gain knowledge in shift of weed flora in long term experiments

7.2 Relevant information

A weed shift is the change in the composition or relative frequencies of weeds in a weed population or community in response to natural or human-made environmental changes in an agricultural system. Susceptible weeds are largely eliminated over time with continued use of the same cultural practice or herbicide. This allows inherently tolerant weed species to remain, which often thrive and proliferate with the reduced competition.

7.3 Weed shift in crops and cropping system

With a foliar herbicide without residual activity like glyphosate, there could also be a shift within a weed species to a late emerging biotype that emerges after application. Growing rice under alternating flooding regimes and residual soil moisture conditions prevalent in the Cauvery Delta region of Tamil Nadu, red sprangletop (*Leptochloachinensis*L.) and European water clover (*Marsileaquadrifolia*L.) became predominant in rice fields by replacing barnyard grass (*Echinochloasp.*). In the eastern Indo-Gangetic Plains, adoption of zero tillage has resulted in an increase in population of globally-significant perennial weeds such as purple nutsedge (*Cyperusrotundus*) and Bermuda grass (*Cynodondactylon*)

7.4 Effect of continuous use of herbicides on weed shifts in rice-wheat system

In long-term experiment on rice-wheat cropping system, continue use of herbicides (butachlor + 2,4-D) and rotational use of herbicides (butachlor/pretilachlor (cyhalofop-butyl) in later years) + 2,4-D in rice and continue use of (isoproturon + 2,4-D) and rotational (clodinafop/isoproturon) use of herbicides in wheat were tested in rice - wheat cropping system.

During winter season, *Phalaris minor*, *Avena ludoviciana*, *Vicia sativa*, *Anagallis arvensis* and *Coronopus didymus* were dominant weeds in wheat. Population density of all these weeds decreased in later years. *Coronopus didymus* was not observed after use of above herbicides. Again after 3-4 years, *Poa*, *Lolium* and *Ranunculus* were appeared. *Poa* and *Lolium* had alarming proportion in the later years while *Ranunculus* disappeared after 2-3 years. Again, after five years of experimentation, *Polygonum* and *Alopecurus* were the new invaders. In the later years, *Trifolium*, *Stellaria*, *Lathyrus*, *Plantago* and *Daucus carota* had little infestation in the experimental field. In kharif, *Echinochloa crusgalli*, *Panicum dichotomum* and *Cyperus iria* were the main weeds initially. The population of these weeds decreased over the years. Lately *Digitaria*, *Ischaemum*, *Aeschynomene*, *Commelina*, *Paspalum*, *Ammania*, *Erioclon*

and *Monochoria* were appeared in the experimental field. The population of *Monochoria* and *Ammannia* was in the decreasing trend while that of *Eriochloa* showed increasing trend. Based on 14 years phytosociological analysis, *Phalaris minor*, *Avena ludoviciana* and *Poa* occurred frequently amongst grasses while *Vicia*, *Anagallis*, *Coronopus*, *Lolium* were common broad leaved weeds during winter. During *kharif*, *Echinochloa*, *Cyperus*, *Panicum* and *Ageratum* *Ammannia* and *Echinochloa* invaded the rice crop.

Exercise:

1. What is weed shift?
2. Write the newly emerging weeds in rice and wheat crops instead of associated weeds?

7.5 Conclusion

Signature of faculty