AMARASINGHE, L. (1999)
Proceedings of the First National Workshop on Alien Invasive Species in Sri Lanka
(B. Marambe, ed), Ministry of Forestry and Environment, Sri Lanka: pp 53-55.

INFLUENCE OF INVASIVE FLORA ON AGRICULTURAL ACTIVITIES

L. Amarasinghe

Plant Protection Service, Department of Agriculture
Peradeniya, Sri Lanka.

SUMMARY

The impact on weeds on agriculture is enormous. The most noxious weeds in agricultural ecosystems of Sri Lanka are exotic and these species possess effective reproduction systems that produce large number of seeds assisting their colonizing ability. Thus, management of weeds invariably becomes an important component of the agricultural habitats. This paper reports some important exotic weeds in agricultural ecosystems of Sri Lanka and their characteristics.

INTRODUCTION

All plant species could be broadly classified as wild, weeds and domesticates in relation to their growing habitats. The wild species usually thrive in natural or semi-natural habitats while weeds and domesticates are characteristic species in habitats that undergo frequent disturbances. Agricultural fields are considered as highly unstable man-made habitats and are maintained through continuous human interference or disturbance.

Wild species are frequently aggressive colonizers. They will colonize pioneer habitats, and when not further disturbed such habitats will be successfully invaded by waves of different wild species until dynamic but essentially stable population balances are eventually achieved. It is interesting to note that, although weeds and domesticates have evolved within the man-made habitats from their wild relatives, weeds and domesticates generally cannot successful competitors with wild species for natural habitats. Although weeds frequently invade pioneer habitats, the wild colonizers soon replace them when the habitat is not further disturbed. Conversely, intense and frequent disturbance common to agricultural habitats are not tolerated by wild species and hence, they hardly colonize agricultural habitats. Unlike

weeds, domesticates have lost the ability to disperse their seeds or vegetative propagules by natural means and exhibit a strong dependence on man for their propagation. Thus, there is a distinct difference among the three groups of plants, *i.e.* wild species, domesticates and weeds in relation to their colonizing/invading ability.

Wild habitats, which are considered naturally stable, can be invaded only by wild species while agricultural habitats exclusively by weeds; domesticates are difficult to be considered as an invasive group of plants due to their inherent deficiencies in colonizing characteristics. In this context, it is less meaningful to tag plants as invasive species in a broader sense as it is virtually impossible to define a set of common characteristics for wild and weedy species. However, this dispute does not arise if invasive plants are categorized into two groups as those that invade wild habitats, wild species in a true sense, and those that invade the agricultural habitats, the weeds.

Weeds have become successful invaders in disturbed habitats due to the presence of special characteristics. These include,

1. ability to fulfill the germination requirements in varied environments.
2. discontinuous germination and higher longevity of seeds.
3. being self-compatibile, but not totally self-pollinated.
4. utilization of un-specialized visitors or wind for cross-pollination.
5. enormous seed output under favourable environmental conditions.
6. high plasticity in a wide range of environments.
7. vigorous vegetative expansion.

Probably no single weed species possess all these characteristics. However, common invasive weed species show most of the above.

Major Invasive Flora in Agricultural Habitats

Agricultural sector of Sri Lanka includes both plantation crops and the domestic food crops dominated by rice. Overall productivity in these crops is constrained by a number of factors of which uncontrolled weed growth receives a high priority. With varied growing conditions among these crops, weed spectrum differs under each cropping situation. As determined by the

colonizing ability, each cropping situation is characterized with a number of aggressive species that are capable of invading into similar habitats.

Weeds pose a serious constraint at nursery stages of all plantation crops. Besides, they also affect on unimpeded growth of these crops at later growth stages. Among the successful invasive weeds in major plantation crops such as rubber, coconut and tea, the most notable species are *Mimosa invisa, Mikania micrantha, Paspalum conjugatum, Imperata cylindrica, Panicum repense, Chromalaena odorata, Pennisetum polystachyon, Lantana camara, Spermacoce latifolia,* and *Erigeron sumatrensis*. Apart from several weed species mentioned hither to, a considerable number of grasses, several sedges and some broadleaves are considered as successful weeds in rice and other annual crops. These include *Echinochloa cruss-galli, Ischaemum rugosum, Cyperus rotundus, Cyperus iria, Fimbristylis miliacea* and *Monochoria vaginalis*.

Management of agricultural weeds in different crops is accomplished through integration of cultural, agronomic, mechanical and chemical control methods. The control and management of major weeds are successful when adopting these methods in all cropping situations. Management of weeds invariably becomes an important component of the whole set of activities in agricultural habitats. Usually all plants other than crops are considered as not important in agricultural fields. In this context, replacement of weeds common to a particular situation by alien invasions is not of significant importance, unless the new entries become more detrimental to the crop growth.