P: ISSN NO.: 2394-0344 RNI No.UPBIL/2016/67980 VOL-3* ISSUE-11*(Part-1) February 2019
E: ISSN NO.: 2455-0817 Remarking An Analisation

To Study the Seed Forms and Germination Behaviour of Some Weed Species Effected by Environmetal

Kaushalya Saharan
Lecturer,
Dept. of Botany,
D.A.V. College,
Sriganganar, Rajasthan, India

Abstract

Ecological life cycle of a plant includes environmental interrelationships of a species in a condition starting from seed germination to seed formation, include climatic feature edaphic conditions(soil type, soil moisture and fertilizers) and biotic factors,(human beings, plants, animals and microorganisms). These different environmental factors determine the occurrence and distribution of weeds. Weeds compete with major crops mainly for space, nutrients, light and water. To control weeds efficiently, information on weed biology especially seed dormancy, germination and emergence timing is of vital importance. Dormancy as a seed characteristic determines the range of conditions for germination. This may provides opportunity for some weeds to escape environmental hazardous or weed control operations and reproduce even under an efficient weed management programme. *Amaranthus spinosus, Chenopodium album, Parthenium hysterophorus* are three selected weed species in northern Rajasthan. The seed germination behaviour was studied under controlled light, temperature and moisture conditions. The application of gibberallic acid stimulated germination especially in the population with higher dormancy levels. Therefore, knowledge of weed seed dormancy and germination characteristics and their interaction with environmental factors is important to predict weed seedling emergence timing and maximize the efficiency of weed management strategies. The results are discussed in the context of the need to develop weed management strategies against these weeds.

Keywords: Germination, Edaphic Factor, Dormancy, Environmental Hazardous, Emergence, Effciency, Seedling, Management Strategies.

Introduction

This study was given on economically important plants. Weeds are major hinderances to food production and economic development. Weeds are useful for ceremonial, medicinal and ornamental purposes and some wild plants important in India in medicine as well as important famine food. Autecological studies on weeds are important to save main crops from their devastation. Weeds are fast growing plants so their demand for mineral nutrients are considerable. Weeds utilise a good portion of moisture from the soil and transpire into the atmosphere. Weeds produce inhibitors from leaves, stem, root, seed and fruits, these inhibitors may inhibit plant growth starting from seed germination. For controlling weeds in any habitat, one need to all aspect in the life-cycle of a particular weed. Such as the type of seeds, polymorphism in seeds, if the weakest link in the life cycle of a weed than it is to be attacked at the particular stage for its control. However, the natural restoration process is still slow in arid regions. Plants have adaptations that promote survival and growth in different areas (Bellard *et al.* 2012). Seeds have special germination mechanisms that allow them to adapt to different environments (Baskin and Baskin 2014). Studies on ecological life have much to contribute to an understanding of the distribution of weed species. Seed germination occurs between minimum and ceiling threshold temperatures, and the highest germination percentage is at the optimal temperature (Dürr *et al.* 2015). Germination of weed species was negligible below 15 degree centigrade. In general germination started when soil temperature was above 18 degree centigrade and continued as long as the soil was moist. Germination behaviour in dimorphic seeds of *Melothria madraspatana*. The application of growth harmone stimulated germination, especially within higher dormancy levels. Similar studied recorded, (*Evanri, M. & M. Mayer 1954*);The effect of IAA on germination of lettuce seeds. Light also play important role in seed germination it determine flower inhibition and the end of dormancy in the buds. Over exposure of light preventing the seed germination. Germination may be inhibited both by over exposure and under exposure. (*HENSON IE. 1970*); The effect of light, potassium, nitrate and temperature on the germination of *Chenopodium album*. The seed germination behaviour was studied under controlled light , temperature and moisture conditions. Similar work recorded (*Tanwar, G.S. & Sen, D.N. 1980*); The effect of light, potassium, nitrate and temperature on the germination of *Chenopodium album*. Dormancy is a state of suspended development. The most common type of dormancy occurring in seeds is hard seed coat dormancy. This hard seed coat dormancy prevents the entry of water, gaseous exchange and requisite light, thus the embryo fails to activated. Dormancy of seeds, delaying germination, until the environment is congenial for the development and establishment of seedlings. It is reported that for better management of the weeds, knowing the habitat, morphology and biology of the weeds are also important. The inhibiting materials diffuse from the seeds, until they reach a level at which they are ineffective. This study evident that low temperature promote and high temperatures inhibit the germination. The effect of light, potassium, nitrate and temperature on the germination of *Chenopodium album*. The germination is also dependant on the action of phytochrome. The colour of seeds play an important role in seed germination. In the different colour which differ in their germination behaviour. Similar results were found in previous research,(*Pandey, S.B. 1969)*; Photo control of seeds germination in *Anagallis arvensis* The viability of seed which ability to germinate of seed and varies from species to species. Longer viability period is better regeneration of the weeds. Seed viability tested by 2,3,5 Triphenyl tetrazolium chloride. Dry and cold storage may keep the seeds alive for long periods. Viability of many arid zone seeds is very high. Vegetative multiplication and perennation process created weeds year after year in the crop fields. Weeds have a large ecological amplitude, so they multiply and flourish well even in changed environments. The range of various factors need to be determined which will throw light on the limit of geographical distribution of species and their causes,(Mall, 1971). In India the climate is temperate, the weeds dominat croplands and fallow and after spring in summer months,when environment slightly warm. In western desert of India , There is always paucity of rainfall, a distinct weed flora appears in rainy season, which has been called mansoonal aspect,(Sen,1966). Many areas of South India where climatic condition are quite favourable for weed growth through out the year. A cold period is needed for flower initiation and biennials characteristically occurs in temperate region. Perennials reproduce by seeds but also tubers, creeping roots, stolons, rhizomes in the ground. Ecological studies of many weeds have revealed the existence of ecotype and ecological races, examples of *Cynodon dactylon (Ramkrishan & Gupta, 1973*), *Portulaca oleracea (Singh,1973*), *Melilotus alba* (Ramakrishanan, 1968) and *Ipomea pestigridis*,(Bhati and Sen, 1978). Seed polymorphism is also common in many weeds, (Sen, 1977). Morphology of seeds play an important role in dispersal for wind dispersal,the seed must be absolutely minute and light. Many weeds have hooks, stiff hairs of stiff ends on their seeds through which they get attached to animals, shoes and clothes of farmers, such as *Tribulus terrestris, Achyranthus aspera, Aristida funiculate* et. Many times plants which are serious in one area may become serious pests in another, the predators attack them in their native home,(biological control). *Perkins and Swegey,(1924*) were the first to report the biological control *of Lantana camara* by an introduction insect. In India the control of *Lantana camara* through insect pests was started by *Beeson and Chatterjee(1940*) and *Khan,(1976)*. A very effective control of *Lantana camara* was noted recently by *Teleonemia scrupulosa* in Hyderabad*,(Verma and Sadatulla,1973) and in Naini Tal,(Anon, 1976)*. *Paulownia accuminata*, a bug is found to feed on leaves of *Salvinia* and is positive mean of its eradication. Another important weed which has been tackled biologically in India is *Opuntia spp*.,(Narayanan et al.,1964). Pathak ,(1968) reported *Tribulus terrestris* by an Insect Poecilocerus species and plant did hardly produce any fruit. In the Indian desert leaves of such as hardy plants as *Calotropis procera* are devoured by Poeciolocerus pictus. Lal et al.(1975) and Gupta (1977) have reported a few natural enemies on some important weeds. Similar work, recorded by (Pathak, P.S.1968), Biological control of *Tribulus terrestris* by insect of Hemiptera. Another important factor is climatic consideration for finding out an effective biological control. The ecology characteristics of an area have a pertinent role in control of weeds through biological means. Chemical weed control began with the work of Charles Darwin,(1881). He exposed coleoptiles of *Avena spp.* and *Phalaris spp*. to light from one side and found that stem tip produced a chemical,which cause dramatic effects on plant growth led to the manufacture of related compounds. Bolly,(1908) reported successful weed control in wheat using common table salt , Iron , sulphate etc. Klingman (1973) reported the cost of developing a herbicide may be about US $ 3,250,000.these chemicals are screened on numerous species before their use on large scale. Similar work done by Sharma, S.K. and Gupta, R.K. 1971. Effect of salt on seed germination of some desert grasses. Fawcett and Slife (1978) found that viability of *C. album, Amaranthus retoflexus L., Datura stramonium L. and Setaria feberi Herrum* seeds produced by 2,4-D and dalapon treated plants was not greatly different from control seeds. Reduced germination or viability due to herbicide application has also been reported by Singhal and Sen (1981), Doliner and Stewart (1992), Young et al. (1984), Kasera and Sen (1986), Catizone and Viggaiani (1990) and Don et al. (1990). In contrast, Hume and

Shirriff (1989) reported an increase in germination in seeds from herbicide-treated plants.The success of *Chenopodium album* as a competitive weed species is attributed to many factors, including seed germination in a wide range of environmental conditions (Henson 1970) and early emergence during the crop growing season (Ogg and Dawson 1984). Immature weed seeds have been shown to be viable and germinate, (Chakravati and Pershad ,1963). Weeds can grow almost everywhere and have become particularly well adapted to agricultural situations, by virtue of the ability to perpetuate themselves through continuous regeneration. The most common regenerative strategy involved in annual weed succession is the accumulation of seeds in the soil, forming persistent seed banks (Grime, 1979; Karssen, 1982; Fenner, 1985). This feature, which renders weeds particularly difficult to control, arises mainly as a result of the property of most of their seeds to remain dormant in the soil until they experience certain environmental factors or undergo certain metabolic changes (Bewley and Black, 1985). Weed seeds may face several different environmental conditions throughout periods of time, as affected by location either upon the soil surface or buried at different depths underneath the soil profile. The burial of seeds can significantly and rapidly decrease photon irradiance, according to our measurements (Lai *et al.* 2015). Several factors are expected to interact to determine whether or not they germinate. Furthermore, the intrinsic characteristics of the seed and its concomitant response to environmental factors are often diverse among seeds from different species, among seeds from different plants of the same species, and even among those from the same plant (Gutterman, 1980/81; Mayer and Poljakoff-Mayber, 1982; Silvertown, 1982; Bewley and Black, 1985; Fenner, 1985). This phenomenon, which has been referred to as polymorphism, heteromorphy or heteroblasty (Bewley and Black, 1985; Fenner, 1985), is a consequence of the genetic variability that characterizes most of the weed species, and it constitutes a feature of great adaptative value since it results in intermittent germination of seeds over long time intervals, ensuring that at least some seeds of a population will germinate while conditions are conductive to successful seedling establishment (Holzner et al., 1982). As outlined above, considerable difficulty exists for plant physiologists, ecologists and weed scientists to understand the behaviour of weed seeds under field situations, and this difficulty imposes a major constraint to prediction of the infestation level that may be expected under a given set of conditions. Therefore, in order to develop new improved methods of weed control it is necessary to gain a better knowledge of weed seed dormancy and germination (Bibbey, 1935; Staniforth, 1961; Chancellor, 1982; Egley and Duke, 1985). From the practical standpoint, to elucidate the factors responsible for the inception of seed dormancy and the conditions conductive to germination might lead to management practices that could either, diminish weed germination or enhance it in order to achieve a later facilitated control. For instance, if seeds of a given species are found to require light and alternating temperatures to germinate, appropriate soil management practices conductive to enhance germination should include practices that prevent seed burial and provide a soil surface devoid of residues. Conversely, germination could be diminished by opposite methods.

Materials and Methods

Seed Forms and Germination

The fundamental aspect of the seed is to germinate and produce. Its dormancy is a state of suspended development. The most common type of dormancy occurring in seed coat dormancy. The hard seed coat prevents the entry of water, gaseous exchange and requiste light, thus embryo fail to get activated. Dormancies of seeds of arid zone plants are biologically significant in spreading or delaying germination until the environment is congenial for the development and establishment of seedlings. Weeds whose seeds germinate over long periods of time are more likely to escape cultivation and chemical sprays. Three types of dormancies are found : Innate ,Induced and Enforced(Thurston, 1959). Innate dormancy is genetic and Induce and Inforced dormancies depend on the intraction of the seed with its environment. Innate dormancy is the failure of the fresh seed to germinate even under favourable conditions. Induced dormancy is that caused by unfavourable conditions.

Causes of Dormancy

Immature Embryo

In some *Ranunculus* species, the embryos are incompletely developed when seeds are shed. The embryos in such cases mature during the dormant period. The dormancy in seeds of *Zomia diphyll* has been attributed to rudimentary embryos by Singh,(1976). Immature weed seeds have shown to be viable and germinate*, (Chakraveti and Pershad , 1963*). It has been observed that considerably high percentage of seeds of *Asphodelus tenuifolius* collected from green capsules, remain viable. Such seeds after 8 months of dry storage show quite high (44%) germination percentage; compared with fully ripened and dried capsules . Inview of this weeded out plants with less developed fruits should not be left in crop field. Thus seed need an after ripening time.

Hard Seed Coat

Impermeability to water due to hard seed coat has been reported in a number of plant species of *Leguminosae, Malvaceae, Tiliaceae, Cucurbitaceae, Convolvulaceae, Gramineae* etc. Obnoxious weed *Xanthium spp*. was observed by Crocker,(1906) where there two seeds with different seed coat permeability to water, while is not so for oxygen. The upper seeds more impermeable to oxygen than the lower one. In seeds of *Amaranthus retroflexus, Alisma plantago* and *Ipomoea aquatic*, the seed coat is permeable to oxygen and water but strong enough to resist embryo expansion. Maximum germination percentage obtained after concentrated sulphuric acid scarification in some of the weeds in the eastern Rajasthan.

Presence of Inhibitors

Inhibiting chemicals in the fruit of seed coats or within the embryo or endosperm, may delay germination. Substances like coumarin, ferulic acid, parascorbic acid dehydracetic acid and ammonia act as germination inhibitors.

In nature, dormancy of seeds are broken by; 1). Slow chemical changes in the inhibitors themselves; 2). Decay of seed coat which contains the inhibitors; 3). The washing away of the inhibitors by rain or running water. Some inhibitor bring about dormancy due to their interference in the normal metabolism of seeds for germination. The inhibiting materials diffuse away from the seeds or are absorbed by the particles of soil, until they are ineffective.

Temperature

In general, the low temperature promote and high temperature inhibit the germination. Many weed seeds in the Indian desert must pass through very high temperature (60-70 degree centigrade) of sand in day and at the same time low temperature (5 to 10 degree centigrade) of night before they are stimulated for germination in the following rainy season. Seeds of *Crotalaria medicaginea* even resist fire and profuse germination takes place in rains after firing these weed infested field.

Light

Launea sarmentosa, Solanum surattense, Mecardonia dianthera, etc do not germinate in absence of light. Whereas light hard seeds of *Nigella sativa, Allium cepa*, and *Cryptostegia grandifolia* do not germinate on the exposure to light. Colour of seed coat also play important role. Seed coat of *Anagallis arvensis* raddish in colour. The light reach the embryo due to red colour and this has a great effect in bringing about germination. Bohra and Sen (1974) found three types of colour in the seed coat of *Crotalaria medicaginea*, i.e. black, yellowish- black and yellow, which differ in their germination behaviour. The germination of many seeds is clearly dependent on the action of phytochrome. The red region of spectrum is most effective for the promotion of germination of the light requiring seeds. Far red is the light of higher wavelength has been reported to reverse the response induced by red. Phytochrome is blue chromo-protein. Its blue colour changes in vitro to a lighter shade or irradiation with far red. The reversibility of these physiological responses to the pigment, now known as Phytochrom, may be written as: Pr = Red, 660/ Far red,730nm x Pfr. When Pr, the form that absorbs red light, is irradiated with red light, it is transformed into Pfr. The Pfr from absorbs far red and when thus irradiated, it is transformed back into Pr. The Pfr also thermally reverts in darkness to Pr. Varshney,(1968), Singh and Garg,(1971), Bhandari and Sen,(1973) and Harsh and Sen,(1976) have report the presence of phytochrome system in *Ocimum americanum, Gossypium hirsutum, Citullus colocynthis* and *Tecoma stans*, respectively.

Induce and Enforced Dormancy

Seeds germinate immediately under favourable conditions may be thrown into dormancy by unfavourable condition, they will not germinate even condition become favourable, this term called Induce dormancy. Seeds which have been exposed to excessive light , for example , may be changed so that they will not germinate later in darkness. Lack of moisture, high Co2, and low O2 may also change seeds so that they refuse to germinate when condition are favourable. Enforced dormancy is caused when seeds are prevented from germination due to various environmental factors such as lack of moisture, oxygen, low temperature or excess of water and reduce light exposure. The seeds germinates immediately when the limiting factor is removed.

g). Death of seeds:

Seeds die in the soil due to: -

1. Disappearance through respiration of the food supplies stored in the seed,
2. Enzyme action and oxidation leading to denaturing of the stored foods,
3. Coagulation of proteins,
4. Accumulation of toxic products,
5. Degeneration of the nuclei. Mutation occurring as a result of long storage may serve as an adaptive mechanism to evolution,(Barton, 1961).

Seed Output

The seed output in a plant species is dependent upon a number of environmental factors, of which light intensity, moisture, biotic influence, diseases, physiological status and age are important. Joshi and Nigam (1970) and Sant (1972, 1974) observed in *Trianthema portulacastrum, Indigofera linifolia, Bothriochola pertusa,* respectively that number of fruits per plant varied when collected from different localities. Reproductive capacity is the product of the average seed output and the fraction represented by the average percentage germination.

Reproductive capacity = Average Seed output x % germination / 100.

Viability of Seeds

The viability of seeds is lifespan of a particular seed during which it is able to germinate, which varies from species to species. Longer viability period ensure a better regeneration of the weed, even when favourable situation is obtained after several years. Seed viability is tested by T T CC (2,3,5- tri-phenyl tetrazolium chloride). If the seed is viable, 1% solution of TTC is turned pink by chemical reaction due to respiration of the viable seed. Dry and cool storage may be keeping the seeds alive for long time. Any condition which reduces the metabolic activity of seeds is usually responsible for increased longevity. Viability of many arid zone seeds is very high, which enable them to tide over several uncongenial environmental condition. The seeds of member of Graminae, Leguminosae, Boraginaecae, Cucurbitaceae can remain viable for long periods varying 1-15 years. Thus the study of this aspect is important to understand the ecological equipment of the weed for regeneration of population.

Perennation

Weeds have varieties of ways by which they perennate year after year in the crop fields. Some of these are: 1). weeds appear dominantly in alternate years, making better chances of their survival (*Crotalaria medicaginea, Merremia aegyptia*). 2). Root systems are often coiled, probably to increase the surface area and length for absorption efficiency(*Convolvulus microphyllus*) 3). Charactristics verticalness with almost no laterals but a tapering main root is a common feature of many arid zone plants (*Boerhavia diffusa, Crotalaria burhia*). Rooting at thicker nodes helps in multiplication of plants (*Citullus clocynthis, Ipomoea pes – caprae*).

Result and Discussion

The germination of weed species was negligible below 15 degree centigrade. In germination started when soil temperature was above 18 degree centigrade and continued as long as the soil was moist. The dormancy is the main factor of the seed germination, dormancies of seeds of arid zone plants are delaying germination until the environment is congenial for the development and establishment of seedlings.

Seed dormancy may be imposed by mechanisms that require particular light conditions in order to be counteracted. This phenomenon has been referred to as positive photoblastism (Evenari et al., 1955) and is common among small seeded species such as *Amananthus retroflexus*, *Chenopodium album,* and many other annual weeds (*Taylorson, 1982; Holzner et al., 1982; Grime, 1982; Smith and Morgan, 1983; Gutterman, 1985).*

Innate dormancy is genetic and Induce and Inforced dormancies depend on the intraction of the seed with its environment. Similar result were recorded in previous work *(Pandya, S.M. and Pathak, V.S. 1980)*; Seed dormancy imposed by covering structures in *Acyranthus aspers. (Martinez-Ghersa, M. A., E. H. Satorre, and C. M. Ghersa. 1997*); Effect of soil water content and temperature on dormancy breaking and germination of three weeds. The results are discussed in the context of the need to develop weed management strategies against three weeds. Seed germination behaviour was studied under controlled light, temperature and moisture condition. . Similar results were recorded by (Steinbaver, G.P., Grigsby, B. 1957); Interaction of temperature, light and moistening agent in the germination of weed seeds. Viability of many arid zone seeds is very high, which enable them to tide over several uncongenial environmental condition. The viability of seeds which depend of any condition which reduces the metabolic activity of seeds is usually responsible for increased longevity. Modern development activities as well as the effects of climate variations have thereby brought about considerable changes in the natural indigenous vegetation. Present study recorded immature weed seeds have been shown to be viable and germinable. In view of this weeded out put plants with less developed fruits should not be left in the crop field. Thus, seeds need an after-ripening time. Germination percentage and can be compared with fully ripened and dried capsules,Table 1.

Impermeability to water due to hard seed coat has been reported that maximum germination % obtained after concentrated sulphuric acid scarification in some of the weeds are shown in Table-2.

Reproductive capacity in the weeds is the product of the average seed output and the fraction represented by the average percentage germination. The seed output in a plant species is dependent upon light intensity, moisture, biotic influence, diseases, physiological status and age are important A comparision of average seed output and reproductive capacity is shown in Table-3.

The viability of seeds varies from species to species. Dry and cold storage seeds alive for long periods. The metabolic activity of seeds is responsible for increased longevity.

In this study, many species of weed were recognised as in-season and in off-season, shown in Table -4.

Table -1

A Comparision of Average Seed Output and Reproductive Capacity in Some Weed Species

Plant species	Average seed output	Reproductive capacity
Mollugo cerviana	1639	777
Gisekia phamaceoides	940	226
Desmodium pulchellum	3169 (Forest patches) 3482 (Dense forest)	752
Borreria articulata	1938-90	321
Asphodelus tenuifolius	2302	2302
Bothriochola pertusa	1157(in winter) 1704 (Rainy)	46 (winter)
Indigofera linifolia	497 in Summer, 427in Rainy	144in summer, 196in Rainy

Table-2

Viability and Germination (%) of Immature Seeds of *Asphodelus Tenuifolius* As Compared With The Mature One

Degree of the maturity	Fresh seeds	1-year old seeds	Viability of 1-year seeds
Seeds from less developed and green fruits	32	20	72
Seeds from fully developed but green fruits	44	68	90
Seeds from ripened and dried fruits	30	88	98

Table-3

A Comparision of Average Seed Output and Reproductive Capacity in Some Weed Species

Plant species	Average seed output	Reproductive capacity
Mollugo cerviana	1639	777
Gisekia phamaceoides	940	226
Desmodium pulchellum	3169 (Forest patches) 3482 (Dense forest)	752
Borreria articulata	1938-90	321
Asphodelus tenuifolius	2302	2302
Bothriochola pertusa	1157(in winter) 1704 (Rainy)	46 (winter)
Indigofera linifolia	497 in Summer, 427in Rainy	144in summer, 196in Rainy

Table 4

Common Weeds Recorded In The Field, In In-Season (July To November) And Off-Season, (January To March) –

	In- Season			Off - season		
Weeds species	**Vegetative**	**flowering**	**fruiting**	**vegetative**	**Flowering**	**Fruiting**
Aerva persica	+	+	+	+	+	+
Alysicarpus vaginalis	+	+	+	-	-	-
Anticharis linearis	+	+	+	-	-	-
Aristida adscensionis	+	+	+	-	-	-
Blumea amplectens	-	-	-	+	+	+
Boerhavia diffusa	+	+	+	-	-	-
Borreria articularis	+	+	+	+	-	-
Celosia argentea	+	+	+	+	+	+
Cenchrus biflorus	+	+	+	-	-	-
Cenchrus setigerus	+	+	+	+	-	-
Citrullus colocycynthis	+	+	+	+	+	+
Cleome viscosa	+	+	+	-	-	-
Convolvulus microphyllus	+	+	+	+	+	+
Corchorus tridens	+	+	+	-	-	-
Corchorus depressus	+	+	+	-	-	-
Crotalaria burhia	+	+	+	+	+	+
Crotalaria madicaginea	+	+	+	-	-	-
Amaranthus viridis	+	+	+	-	-	-
Cyamopsis tetragonoloba	+	+	+	-	-	-
Cyperus rotundus	+	+	+	-	-	-
Dactyloctenium aegyptium	+	+	+	-	-	-
Digera muricata	+	+	+	-	-	-
Euphorbia prostrata	+	+	+	+	-	-
Echinops echinatus	+	+	+	+	-	-
Euphorbia prostrata	+	+	+	-	-	-
Eragrostis ciliaris	+	+	+	-	-	-
Fagonia cretica	+	+	+	-	-	-
Farsetia hamiltonii	+	+	+	-	-	-
Heliotropium marifolium	+	+	+	-	-	-
Heliotropium subulatum	+	+	+	+	+	+
Indigofera cordifolia	+	+	+	-	-	-
Indigofera hochstetteri	+	+	+	-	-	-
Indigofera linifolia	+	+	+	-	-	-
Indigofera oblongifolia	+	+	+	+	+	+
Ipomoea sindica	+	+	+	-	-	-
Ipomoea pes-tigridis	+	+	+	-	-	-
Justicia simplex	+	+	+	-	-	-
Launaea nudicaulis	+	+	+	-	-	-
Melothria maderaspatana	+	+	+	-	-	-
Mollugo cerviana	+	+	+	-	-	-
Oldenlandia aspera	+	+	+	-	-	-
Oligochaeta ramosa	+	+	+	+	+	+
Phyllanthus fratermus	+	+	+	-	-	-
Polycarpaea corymbosa	+	+	+	-	-	-

Polygala chonensis	+	+	+	-	-	-
Pulicaria crispa	+	+	+	+	+	+
Paspalum distichum	+	+	+	-	-	-
Sida rhombifolia	+	+	+	-	-	-
Solanum surattense	+	+	+	+	+	+
Tephrosia purpurea	+	+	+	+	+	+
Tragus racemosus	+	+	+	-	-	-
Trianthuma govindia	+	+	+	+	+	+

+ = Present, - = Absent.

Weeds have a large ecological amplitude, so they multiply and flourish well even in changed environments. Many species found in Indian arid zone are recognised as in- season and as off- season weeds.

Aim of the Study

The effect of light, Potassium, Nitrate and tempreature on the seed germination, seed colour, seed viability, seed coat permeability and seed behaviour.

Conclusion

The present study is a report of different weed species of northern Rajasthan. Regular and periodically visits to different habitats were made intensive survey. The natural vegetation in plains, is much disturbed on account of increasing population pressure, over grazing, excessive lopping of trees and shrubs for fuel and fodder and increasing agriculture practices. The weeds that which occur in the winter crop are more gregariously and can thus be troublesome to some extent, the effect of temperature on the germination response of two categories of morphologically different seeds. Germination response of dormant seeds was not affected by temperature, as 96% of the seeds germinated at all temperatures on scarification. On the other hand, non-dormant seeds were temperature sensitive and germinated best at 32°C. However, storage affected the germination responses of both types. While the seeds lost moisture gradually with storage time and retained viability for a longer period. Effect of growth modifiers on the process of seed germination in some selected weed species has also been studied.The data have adequately been suplimented with tables and text figures . Important conclusion with regard to mode and magnitude of growth and dispersal in relationto physical and chemical environment can be established from such studies. These studies help in an understanding of biological requirement of a species to cope with the environmental flux.

References

Andres, L.A.& Goeden, R.D. 1971. The biological control of weeds by introduced natural enemies. In: Biological control. (ed.) C.B. Muffaker. Plenum Press, London, pp. 143-164.

Borger C and Hashem A (2017); Summer weed germination: fleabane, sowthistle, button grass and tar vine. Proceedings of GRDC Research Update 2017.

BASKIN JM AND BASKIN CC. 1977. Role of temperature in the germination ecology of three summer annual weeds. Ocologi (Berl), 30 : 377-382.

BASKIN JM AND BASKIN CC. 1973. Plant population differences in dormancy and germination characterstics of seeds: Heredity or environment: Am Midi Nat 90 : 493-498.

Chandra Singh, D.J. & Rao, K.N. 1975. Herbicidal control of weeds in maize. Pesticides 9: 19-21.

Choudhri, G.N. and Srivastava, P. 1990. Survival strategis of weeds – seed germination, nutritional differences and seedling survival. J. Indian bot. Soc. 69 :299 – 304.

Cohn, M.A., Butera, D.L. and Hughes, J.A. 1983. Seed dormancy in red rice 111. Response to nitrate and ammonium ions. Plant physiol, 73: 381 – 384.

Egley, G. H. 1990. High-temperature effects on germination and survival of weed seeds in soil. Weed Sci. 38:429–435.

Evenari et al., (1955); That require particular light condition in order to be counteracted .it refferred to as positive photoblastism.

Evanri, M. & M. Mayer 1954. The effect of IAA on germination of lettuce seeds Bull Res Coun Israel 40 : 81 – 82.

Harper, J.L., Lovell, P.H. and Moore, K.G. 1970. The shapes and sizes of seeds. Ann. Rev. Ecol. and Syst., 1: 327 – 356.

Hendricks, S.B. and Taylorson, R.B. 1974. Promotion of seed germination by nitrate, nitrite, hydroxylamine and ammonium salts. Plant physiol. 54: 304 – 309.

HENSON IE. 1970. The effect of light, potassium, nitrate and temperature on the germination of Chenopodium album L. weed Res 10: 27-39.

Karssen, C.M. and De Vries, B. 1983. Regulation of dormancy and germination by nitrogenous compounds in the seeds of Sisymbrium officinale L.(hedge mustard). Aspects of Applied Biology. 4: 47 – 54.

Kasera, P.K. & Sen, D.N. 1987. Effect of some post emergence herbicide on sugar content of weeds in Indian arid agro-ecosystem. Indian bot. Report 6(1): 29-31.

Kumar, S. 1980. Seed germination in Trianthema portulacastrum Linn. Effect of pre-treatment on germination. Indian J. Ecol. 7: 113-144.

Madsen, S.B.: Germination of buried and dry stored seeds.111. 1934-1960. Proc. Int. Seed Testing Ass. 27, 920-928 (1962).

Martinez-Ghersa, M. A., E. H. Satorre, and C. M. Ghersa. 1997. Effect of soil water content and temperature on dormancy breaking and germination of three weeds. Weed Sci. 45:791–797.

Miller, C.O. 1961, KN & related compound in plant growth Ann Rev Plant Physiol 12: 395-408.

Modiwala, Q. A.M. and Dubey, P.S. 1976. Dormancy, germination and seedlings emergence in weeds of kharif season. Giobios 3: 42-44.

Naik, S. 1954, Effect of IAA on the rate of seed germination Leguminous seeds J. Indian Bot. Soc. 33: 153-161.

Pandey, S.B. 1969. Photo control of seeds germination in Anagallis arvensis trop Ecology 10: 96-138.

Pandya, S.M. and Pathak, V.S. 1980. Seed dormancy imposed by covering structures in Acyranthus aspera Linn. Giobios 7: 74-76.

Pathak, P.S.1968. Biological control of Tribulus terrestris by insect of Hemiptera. Proc. Sym. Recent Adv. Trop. Ecol. pp. 697-701.

Quinlivan, B.J. 1971. Seed coat impermeability in legumes. J. Aust. Inst. Agric. Sci.,37: 283-295.

Ramkrishan, P.S. and Khosla, A.K. 1971. Seed dormancy in Digitaria adsendens(H.B.K.) Hen and Echinocloa colonum Linn. with particular references to covering structures Trop. Ecol., 12: 112-122.

Rolston, M.P. 1978. Water impermeable seed dormancy. Bot. Rev., 44 : 365-396.

Saimbhi, M.S., Chadha, M.L. & Randhawa, K.S. 1976. The performance of pre- and post plant application of weedicides in brinjal (Solanum melongena L.). Punjab Vegetable Grower 11: 44-46.

Sen, D.N. & Chawan, D.D. 1971. Action of growth retardants on seed germination and early growth in leptednia pyrotechica. Biochem Physiol Pflanzen 162: 484-494.

Sharma, A.K. & C.M. Govil, 87. Seed germination of some Cucurbits in Response to growth Regulators. J. Indian Bot Soc. 66: 132-136.

Sharma, S.K. and Gupta, R.K. 1971. Effect of salt on seed germination of some desert grasses. Annals of Arid zone, 10: 33-36.

Sheldon, J.C.: The behaviour of seeds in the soil 111. The influence of seed morphology and the behaviour of seedlings on the establishment of plants from surface lying seeds. J. Ecol. 62, 47-66(1974).

Steinbaver, G.P., Grigsby, B: Interaction of temperature, light and moistening agent in the germination of weed seeds. Weeds 5, 175- 182 (1957).

Tanwar, G.S. & Sen, D.N. 1980. Germination behaviour in dimorphic seeds of Melothria madraspatana L. Flora 170: 351-353.

Werker, E.1981. Seed dormancy as explained by the anatomy of embryo envelops. Israil J. Bot. 29 : 22-44.

YOUNG FF, GEALY DR AND MORROW LA. 1984. Effect of herbicides on germination and growth of four weeds. Sci. 32: 489-493.