

SELECTION OF BREEDING STOCK FOR LIVESTOCK IMPROVEMENT

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Selection is used as a tool for livestock improvement. A breeding stock is a group of males and females which act as parents of future generations. Selection is the process of allowing certain animals to be parents of future generations while culling others. Culling is the removal of animals which do not perform to the desired level, from the herd. The animals retained have certain desirable characteristics which make them produce more.

Selected animals make up the breeding stock.

The breeding stock should pass the good qualities to their off-springs for better performance, to improve the livestock. Selection process repeated for many generations increases chances of formation of desirable qualities in an animal. Genetically termed as gene frequency (occurrence of the genes that carry desirable characteristics). Selection increases occurrence of desirable genes and decreases occurrence of undesirable genes. During selection, the characteristics to be selected for are first studied closely to ascertain that it is not influenced by the environment, but mainly by the genetic make-up. Selection helps improve characteristics which are highly heritable. Heritability means the likelihood of a particular trait to be transmitted to the offspring and they are strongly inherited. A character like milk yield is lowly heritable, i.e. it is weakly inherited and a bigger percentage of the character is affected by the environment.

The degree to which selection affects a character depends on the following factors;

The heritability of the character, The intensity with which the selection is done and the interval between generations and kind of selection being practiced.

Factors To Consider When Selecting A Breeding Stock.

1- Age

Young animals, those that have not parturated for more than 3-times, should be selected. They have a longer productive life, old animals are poor breeders and low producers as the production and breeding efficiency decline with age.

2- Level of performance

Animals with highest production level selected and performance best indicated by records.

3- Good performance of animal indicated by;

High milk, wool and egg production, good mothering ability, high prepotency (breeding value) which is the ability of a parent to pass good qualities to their offsprings. The animals with poor performance should be culled. Good records kept and used by the farmer for this purpose.

4- Physical Fitness

Animals selected should be free from any physical defect e.g. single-eyed, limping, irregular number of teats, scrotal hernia, defective and weak backline

5- Health

Sick animals do not breed well and are expensive to keep. Animals that are resistant to diseases pass these characteristics to their off-springs

6- Body Conformation

Animals for breeding to be selected according to proper body conformation. A dairy cow should be wedge-shaped with a large udder, thin legs, and long neck.

7- Temperament or Behaviour

Animals with bad behaviors should be culled. e.g Cannibalism, egg eating, aggressiveness, kicking

8- Quality of products

Select animals that give products of high quality such as meat, wool, eggs, milk.

9- Mothering Ability

Animals selected should have a good mothering ability. That is animals with good natural instinct towards their young ones. This will enable them to rear the young ones up to weaning.

10- Adaptability

Animals selected should be well adapted to the prevailing climatic condition in the area e.g Ardi and semi arid areas.

11- Prolificacy

Animals selected should be highly prolific. That is, animals with the ability to give birth to many off-springs at a time. This is a quality that should be considered when selecting sheep, goat and rabbits. The ancestry records assist to choose the prolific breeds for mating

SELECTION OF CATTLE, BUFFALO AND SHEEP

Selection in cattle/buffalo

Consider the level of Performance Which Include, Milk Yield fat Content, lactation length, dry period, services per conception, Calving Intervals. Age of the Animal, Fertility, physical Fitness, Health of the animal, Body Conformation and suitability of the enterprise-milk or beef

Selection in sheep

Consider the level of performance which includes; Mothering ability, Growth rate, Wool quality, Carcass quality and prolificacy. Suitability to the enterprise-wool or mutton, Flocking instinct Health of the animal, Physical fitness, Inheritable defects, Fertility, Inheritable defects.

Selection in Goats Consider the following:

Fertility, Mothering ability, Growth rate, Twinning rate, Carcass quality/dressing percentage, Growth rate, Suitability to the enterprise - milk or mutton, Health of the animal and Age.

Selection in Camels

Health of the animal, Age, Temperament, Foraging ability, Fertility, Level of performance-milk, meat, fur and transport.

METHODS OF SELECTION

Mass selection- Animals with superior characteristics (highly heritable breeds) are selected from a herd and then allowed to mate among each other at random. The off-springs will show higher performance than their parents. This is because mass selection increases the occurrence of the desirable genes in a population.

Progeny testing- is a offspring resulting from selected parents (Family selection).In this method a group of progenies (off-springs) are used as an aid to increase accuracy in the selection of a breeding stock. This is method is used when the character to be selected is of low heritability and expressed by one sex only. This method takes upto nine years for the results to be seen.

Contemporary comparison refers to other heifers in the herd sired by the same bull. This is a progeny tasting method which involves comparison of average production of daughters (Heifers) of each bull with that of the other heifer referred to as contemporaries. In this method it is assumed that the differences between the herds of the same breed are non-genetic in origin.

Advantages:

1. It is possible to compare heifers of different ages in different locations worldwide.
2. It eliminates difference brought about by the environment.
3. it is possible to make direct comparison of candidate bulls at different artificial insemination centres.
4. It is accurate since we are using a large herd of animals.

ESTABLISHING ORNAMENTAL PLANT NURSERY

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Introduction

Quality of ornamental planting stock is one of the key factors that determines the success of ornamental plants business. The survival of plants, growth performance length of rotation period and volume and quality of plants are significantly affected by the quality of plant seedlings. Ornamental nursery is a place or establishment for raising or handling of young plant species until they are ready for permanent planting. A good nursery employs the best nursery practices.

There are different types of nurseries depending on type of business like: private or

individual, government or community, training or research, wholesale and retail nursery and the objective of the best nursery practices is to produce high quality seedlings of the desired species employing the most cost-effective, environment friendly and socially acceptable technologies. One of the major reasons of for the failure of the planting developments is the use of inferior planting stocks and shortage of quality planting materials. Thus, in order to produce large quantities of planting materials, the establishment of proper ornamental nurseries is essential.

This guideline discusses the simple procedures, tips for producing high quality seedlings and nursery management & practices.

Nursery site selection

- ◆ Selection of an ornamental nursery site should be carried out with proper judgement and consideration, since several important factors, such as the location of the proposed site, soil, climatic factors, topography, economic factors and water supply, have a major effect on its overall success. The important factors and criteria in the selection of an ideal ornamental nursery site are described below.

Topographical Aspects

- ◆ The nursery should be located on level or gently sloping ground. However, ground with a slight slope not exceeding 3% is recommended for better surface drainage.
- ◆ Areas with slopes greater than 3% should be avoided because of the possibility of soil erosion and the difficulty faced in carrying out ground maintenance. Such areas may also sometimes cause undesirable translocation of soluble fertilizers.
- ◆ Furthermore, areas with high water table and those prone to regular seasonal flooding should also be avoided. However, some short-term nurseries are established on a terrain and terraces are prepared for easy handling of the nursery operations.

Soil aspects

- ◆ The nursery site should have fertile topsoil which is moderately well-drained and preferably sandy loam. Areas with rocks and large stones are less desirable because such obstacles may impede many operations associated with modern nursery practices.
- ◆ The optimum soil pH value for most ornamental plants is between 5.5-7.5. It is therefore desirable that the soil at the nursery should have a pH value within or close to this range.
- ◆ The soil and vegetation at the nursery site should be closely examined to determine whether the site is free of insects, fungi and nematodes, or weeds that can damage or kill stock plants later.

Location and accessibility

- ◆ Location and easy accessibility are also key success factor of any nursery. Nursery area should be accessible to main road that will accelerate the plants sale and transport to other cities.

- ◆ The nursery area should not expose to floods and strong winds and must receive plenty of light.
- ◆ Easy accessibility will ease out the customers and visitors that will has positive impact on sale and nursery business.

Power supply

- ◆ A nursery site should be accessible to transmitted electricity supply because electric power is needed for Lighting and the operation of nursery equipment, including irrigation pumps, and so on.

Water supply

- ◆ Ornamental plant nursery site should be close to good quality water source. Canal water is recommended for most of plants if available. Underground can also be used if quality of water is good. The water should be clean and free from pollutants and industrial wastes that might be detrimental to plant growth.
- ◆ It is prerequisite to get water tested before applying to plants.

Space and size

- ◆ The nursery site should have ample space to accommodate all the nursery requirements.
- ◆ A regular four-sided site, preferably a square, is desirable to minimize the length of the boundary fence.
- ◆ An adequate area is also needed for future expansion of the nursery.

Labour

- ◆ Even though many of the operations at the nursery can continuously and effectively be carried out using machines, manual workers nevertheless must be employed to carry out specific jobs. The nursery should not be far away from settlement areas where workers are available.

Telecommunications

- ◆ Telecommunication is necessary when operating a nursery. A telephone Line should be installed to allow for immediate communication. Internet facility will ease out the online selling of plants.

Design and Lay-Out

- ◆ A well-designed nursery should have proper roads, fencing, office, potting and transplanting sheds, seed germination and growing areas, water supply, telecommunications, water sprinkler system etc.
- ◆ Consideration should also be given to the construction of storage facilities for nursery

equipment, tools, fertilizers, pesticides and other materials

Nursery Structures

- ◆ Lay-out of facilities should consider the chronological of activities in the nursery to ensure smooth flow of movements of materials & personnel within the nursery.
- ◆ Facilities could be modified depending on the objectives of the production, serviceability of nurseries & financial factors

Construction of soil treatment facilities

- ◆ Generally, nursery should have soil treatment facilities and all the media must be sterilized prior to use to avoid later problems with soil borne seedling diseases.
- ◆ Sieving the soil to 5mm mesh to remove large particles.

Construction of potting shed

- ◆ In potting shed, seedling pots are filled with potting substrates.
- ◆ A roofed potting shed is recommended to prevent the potting substrates from getting wet and that may lead to waterlogging.
- ◆ The floor must be flat, dry, and free of weeds to avoid any sort of contamination. There should be enough area allocated for shed easy piling of the pots, container, and stock of the potting substrates.

Construction of germination shed

- ◆ The germination shed area should be close to the potting shed area for ease of pots transportation.
- ◆ Preferably, germination shed should have a polyethylene covering to permit sufficient sunlight to enter and protect the seeds from rains and birds.

- ◆ The size of the germination shed will depend on the number of seeds to be sown, seed size, sowing method, quality of the seeds and sowing distance
- ◆ Seedbeds are generally 1.2 m wide and 5 m long.
- ◆ The seed beds should be slightly elevated, approximately 10-15 cm above ground Level, and supported with wooden boards or bricks.
- ◆ Whenever practicable, the sides of the beds should be bordered wit treated wood planks, adobe or stone to keep the soil from being washed away.

Construction of transplanting shed & beds

- ◆ After seedling transplanting from germination trays or seedbeds to individual pots, it is advised to keep the seedlings in the transplant shed.
- ◆ The transplant shed need to be covered for protection of young transplanted seedlings from scorching sunlight but at the same time it must permit sufficient light for optimum seedling’s growth.
- ◆ Ideal bed size should be 1m to 1.5m wide, this will ease out the daily maintenance nursery operations.

Construction of hardening area

- ◆ Prior to planting, seedlings must be sturdy and hardened-off to tolerate adverse field conditions.
- ◆ This area should be shade free to offer the seedlings full sunlight exposure.
- ◆ This area should be raised from the ground with good drainage.

EQUIPMENTS & TOOLS

EQUIPMENT	DESCRIPTION
1. Wheelbarrow	for moving small loads of materials
2. Knapsack sprayer	For spraying insecticide, fertilizer
3. Sterilization pan	for pasteurizing the germination media
4. Mask, boots, rubber gloves	Proper personal protective equipment
TOOLS	
1. Shovel	for mixing the potting media
2. Pruning shears/pruning knife	for pruning long taproots that grow outside the seedling pot
3. Hand trowel/shovel, scoops	Use for breaking clods, hole digging, for seedling planting and weeding and hoeing, also for fertilizer mixing or other soil amendments.
4. Screen sieve	For sieving of potting media to make it fine.
5. Water hose/sprinkler	For watering the seedling pots
6. Seed jar/seed sack	For seed storage
7. Bolo	For cleaning
8. Carpenter’s toolbox	For repairing