



BEST PRACTICES

In the previous lessons till now, you have learnt about the different aspects of bamboo cultivation. If you want to establish a commercial plantation of bamboo you must take care of all the stages in it like, site selection for the plantation, procurement of good planting material, field planning, harvesting, storage and transportation etc. Thus, you must have a well laid plan of events that are to be followed. You know that India is a vast country and has many agro-climatic zones and variations in topography, climate and soil conditions. It is not easy, therefore, to provide a calendar of operations for bamboo plantations that will apply in all conditions and locations. There are, however, some basic principles that should be adhered to, irrespective of the variations. Let us learn in this lesson the various things that we can do at various stages of the bamboo plantation to get maximum yield and of best quality. The requirements of bamboo cultivation may be different in each subsequent year of plantation. Therefore, the major events and consideration to be taken care in each year are also discussed in this lesson. You will also learn about various tools that are routinely used in the bamboo cultivation.



OBJECTIVES

After reading this lesson, you will be able to:

- list the tools and equipment for bamboo plantation;
- create calendar of events in bamboo growth;
- plan the irrigation, weeding and fertilizer operations during I, II, III and IV year onwards.



7.1 TOOLS AND EQUIPMENT FOR BAMBOO PLANTATION

You should be familiar with the common tools that are used routinely in bamboo cultivation. They are required for variety of purposes like soil preparation, cutting and felling of bamboo culms, cleaning etc. Tools such as spades, picks, pruning scissors, hand wheelbarrows and others (Fig. 7.1 to 7.11) are necessary equipment for manual operations in bamboo plantation. Such equipment are affordable and don't require high investment.

Inter-culture



Fig. 7.1: Khurpi or weed scrapper



Fig. 7.2: Pruning shears

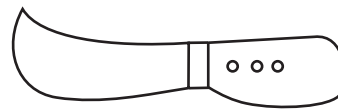


Fig. 7.3: Pruning knife

Harvest



Fig. 7.4: Cutting bamboo at 2nd node from bottom



Notes



Fig. 7.5: Hacksaw



Fig. 7.6: Cutting shoot

Other



Fig. 7.7: Machete

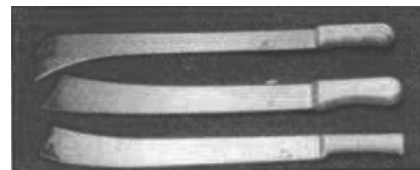


Fig. 7.8: Dao sword

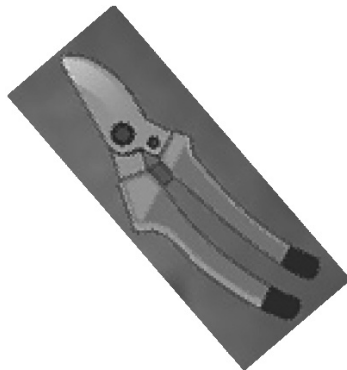


Fig. 7.9: Cutter



Fig. 7.10: Knife



Fig. 7.11: Spade

These pictures are only representational



7.2 CALENDER OF EVENTS IN BAMBOO PLANTATION

The country's most important climatic event is the monsoon. The life-cycle of the bamboo plant is dependent on it and is largely affected by it. The bamboo plant most actively grows in this wet period. Because of the conducive (best for growth) moisture, humidity and temperature new shoots come out in this period. Most of these shoots will develop into healthy culms, growing taller over a period of a little over three months after emergence. After the monsoon, cooler and drier conditions begin. In this period, the plant system enters a period of dormancy during which it limits its activities and stores food and nutrients. Planting could be in June / July (depending on rainfall), so please plan backwards from these two months.

INITIAL ACTIVITIES	To be completed by					
	Feb.	Mar	Apr.	May	Jun.	July
Site Selection and finalization, survey and demarcation	√					
Fencing and protection,	√					
Selection of species, preparation of planting plan and layout	√					
Clearing the land and ploughing		√				
Soil sampling and testing		√				
Trench making		√				
Establishment of a nursery/plant material production facility, (if intended) OR getting plant material		√				
Pit digging			√			
Soil preparation, application of compost/ fertilizer in the pits				√		
Pit staking					√	
Planting in pit, irrigating the pit and its environs						√



Notes

Establishing and managing a plantation involves a wide range of activities. Using the onset of the monsoon as a benchmark (indicated as M, the expected month, in the table on the previous page), and allowing for local variations, it is possible to classify, list the sequence and give the timing of these activities.

7.3 POST-PLANTING ACTIVITIES: YEAR I

7.3.1 Fertiliser

Initial application of fertilizer in the pit at the time of planting should be there. After that, chemical fertilizer, if used, should be applied again within a period of 1-2 months after planting. The dose will need to be repeated at 5- 6 months after the close of the monsoon. Under normal soil conditions, a general norm that can be followed for application of chemical fertilizer, per plant, is: 185-150 grams N + 75 grams P + 37 grams K. If organic fertilizer is used, organic nutrients should be regularly and continuously applied over the year.

7.3.2 Irrigation

In the first year, special care should be taken that the plant does not suffer prolonged dry period. Usually, in the first month after planting, irrigation should be done at 2-3 days intervals initially and then once a week after that. If the rainfall is adequate, irrigation may be discontinued. After the monsoon and depending on the rainfall/moisture adequate irrigation can be done. In the first year, the irrigation required is relatively higher than in succeeding years. In most parts of the country, at least two major irrigation cycles are needed - two months after the close of the monsoon and four months after the close of the monsoon.

7.3.3 Weeding

Regular weeding is necessary in the first year. This is to avoid competition with the bamboo plant. In most parts of the country, there are two weeding operations done- once in the second or third month after planting and once two months after the close of the monsoon. However, in areas with high amount of rainfall more cycles of weeding will be required.

7.2.4 Loosening the Soil, Mulching and Mounding

These should be carried out in the colder months, later by three months after the close of the monsoon. They should be repeated five months after the monsoon ends.



7.4 NURSING A PLANTATION: YEAR 2

In the second year, the pattern of activities outlined for the first year will continue in the same broad time periods. The clump structure of the plantation by second year will be sparse although greener. Other important points to be followed are:

- Fresh planting will be needed to cover the gaps caused by plant deaths, if any that have occurred in the first year.
- The timing and dosages of fertilizer application will remain the same as in the first year, unless specifically needed or recommended by specialists and the experience of the preceding year.
- Irrigation intensities, as well as soil loosening, mulching and mounding, will continue in the same manner, with appropriate modifications where necessary.
- Fencing should be checked and gaps should be closed.

7.5 NURTURING A PLANTATION: YEAR 3

In this year, shoots will grow into culms that are substantially taller than those of the preceding year. The clump structure will now be clearer. A canopy begins to form and the bamboo plant, including its rhizomes and roots, will have begun to spread itself. While the basic sets of activities will remain the same as in the preceding two years, there will be some modifications as listed below depending on the emerging clump structure:

- During the monsoon, monitor the shoot growth. Discard the weak shoots.
- Carry out manipulation of the clump structure and cleaning operations in the middle of the period of dormancy, typically in the month of January.
- The need for weeding may be less, but is still important, so it is done as per need.

7.6 THE BEGINNINGS OF MATURITY: YEARS 4 AND 5

By now, the plantation will be with arching canopies, highly visible and established clump structures. The clump will have many tall culms. It will now be possible to make out differences in health and strength (vigor of growth) across clumps. These may be due to variations in the microclimate (moisture, soil), or inappropriate thinning and maintenance. The core activities will have to be continued, but clump management becomes more important from now onwards.



Notes

Special attention should be paid to selective cutting of older culms (those that originated in the second year), thinning, pruning of lower branches, removing diseased shoots and mulching and mounding activities. By now the leaf litter on the ground will be a lot and can be put to use on the plantation. Weeding will be required in less frequency as the clump structures have established themselves.

7.7 REAPING THE BENEFITS: YEARS 5, 6, 7 AND ONWARDS

By this time the bamboo plantation would have dominated the site and grown into a self-sustaining system, managing many of its needs.

While fertilizer and irrigation needs will continue, maintenance needs will be less. Management and harvesting are the most important activities to be carried out in these years.

Third-year culms can now be harvested and extracted. This will help maintain a proper clump structure and provide income.

7.8 HEALTH AND SAFETY PRECAUTIONS

While working in the bamboo field you must observe certain health and safety precautions. Failing these precautions there are chances of accidents or health hazards. The important precautions are as follows:

- You should ensure availability of all the necessary first Aid for safety measures.
- During harvesting of bamboo ensure that the workers wear tight clothing and tie-up their hair to avoid entanglement.
- Proper procedure for felling should be followed to avoid crush type of accidents.
- You must effectively use all the necessary safety material and follow all the preventive measures to avoid any injury during usage/application of pesticide.
- Dispose the chemical safely after treatment.
- All chemical formulations contain toxic components and should be handled with great care. Precautions are necessary during preparation of solution, treating operations and handling.



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- The treatment area should be well ventilated with no unauthorized entry.
- You must wear aprons, work clothes, gloves, protective goggles, footwear before preparation of solutions, treatment and handling of freshly treated material.
- Spraying of chemicals should be done in the wind direction.
- No drinks or food should be consumed in the treatment area.
- As solvents used in some formulations may be flammable, the treatment area should be declared as no smoking zone.
- Empty containers should be placed out of reach of non-technical personnel and children, and properly disposed of by burying in the ground at designated locations **or** incinerated.
- Skin contact with preservatives should be avoided. In case of any irritation, the skin should be washed thoroughly with soap and water.
- Clean hands with soap, take a shower and change work clothes after finishing the job.



Notes



Few important items (the 3Gs) to be used while working in the bamboo field



Gloves



Goggles



Gumboots



INTEXT QUESTIONS 7.1

1. Fill in the blanks
 - (a) The most intensive active growth period in bamboo is during
 - (b) The application of NPK fertilizer in the bamboo field should be in ratio



Notes

- (c) During first year of growth, prolonged period of is detrimental to bamboo plant.
- (d) Canopy in the bamboo plantation begins to form during year.

2. State whether True or False

- (a) Weeding is done to increase the competition for space, sunlight and nutrients.
- (b) Cleaning operation and manipulation of clump should be carried out during monsoon.
- (c) Soil loosening and mounding should be done in colder months.



WHAT YOU HAVE LEARNT

Let us recapitulate and enlist the salient points we have learnt through this lesson:

- Calendar of operations for bamboo plantation may vary according to climatic conditions and location.
- There are different tools that are used at different stages and for different purposes in the bamboo plantation.
- Fertilizers should be applied in 5 – 6 months after the close of monsoon.
- Under normal soil conditions, the general norm of applying NPK fertilizer is in the ratio of 5 : 2 : 1 or 4 : 2 : 1.
- Irrigation should be continuously done in an interval of 2-3 days. The interval should be longer if conditions are wet due to more rainfall.
- Weeding must be done in required intervals especially during the 1st and 2nd year. Weeding can be more frequently required in places with high rainfall and heavy weed infestation.
- Loosening of soil, mulching and mounding activities should be done throughout the year.
- After 2nd and 3rd year, the clump becomes more spread-out. At this stage care should be taken to remove unhealthy, malformed and weak culms from the clump.

Best Practices

- During these years and afterwards, clump cleaning and harvesting operations become more important.
- There are safety and health measures and precautions that must be followed while working in the bamboo fields.



TERMINAL EXERCISE

1. List the activities that should be taken care of during first year of bamboo plantation.
2. What are major points of attention during 3 and 4 year of plantation to have good yield?
3. List the major calendar events during bamboo plantation growth.
4. What are different tools that can be used in bamboo plantation?
5. Write safety and health precautions that must be followed when working in the bamboo fields.



ANSWERS TO INTEXT QUESTIONS

7.1

1. Fill in the blanks
 - (a) Monsoon
 - (b) 5 : 2 : 1 or 4 : 2 : 1
 - (c) Drought/dryness
 - (d) Third
2. State whether True or False
 - (a) False
 - (b) False
 - (c) True

Key Learning Outcomes

- Appropriate use of tools and equipment for bamboo plantation taking necessary precautions.
- Follow different cultivation practices at suitable time as per the growth of bamboo culm.



Notes