1. **Linseed (*Linium ustitatissimum*** L.**)**

**Botany and importance**

It belongs to plant family Linaceae and locally known as Alsi. It is an annual rabi plant grown for its seed and fiber. The stem is thin and rounded, and about 50-100 cm tall. This crop has tap root system and flowers may be white, blue, or dark-red. The fruit is capsule containing about 10 shiny, flat seeds. The seed contains 20-25% protein and 30-40% oil. It is used in the manufacture of paints, varnishes, paper and strawboard.

**Climate**

Linseed is grown in temperate as well as tropical regions.

**Varieties**

* Chandni

**Soil and seedbed preparation**

Well-drained medium-loam soil is best for this crop cultivation. It can be planted in both rainfed and irrigated areas. For seedbed preparation two ploughings are required for each followed by planking.

**Sowing time**

* 15 Oct - 15 Nov

**Seed rate**

* Use 6 kg/acre in irrigated areas and 8 kg/acre in rainfed areas.

**Sowing method**

Cultivation is done with drill in rows 30 cm apart.

**Fertilizer application**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Crop** | **N** | **P** | **K** | **Fertilizer**  |
| Linseed  | 23 | 23 | 12 | 1 bag DAP+1/2 bag urea+1/2 bag SOP/MOP |

**Irrigation**

Normally, 3-4 irrigations are applied especially at following stages.

* Before flowering.
* After flowering.
* At pods formation.

**Weeds**

Itsit, jawai, dumbi Sitti, lashkni booti, bathu, krund and shahtra.

* Daab method and hoeing are traditional methods to control weeds.
* Use Pendimethaline @ 800ml/L to control by chemical method.

**Diseases**

Alternaria blight, white rust, downy mildew, stem rot and bacterial black rot are most serious disease which can be controlled by seed treatment with fungicide.

* Concern to extension workers and use recommended chemicals.

**Insects**

Termite, grass hopper, aphid, mustard sawfly, cabbage butterfly and painted bug.

* Use recommended insecticides to control these insects.

**Time of harvesting**

 This crop is harvested at end of April or start of May.

TIL (*Sesamum indicum* L.)

BOTANICAL CLASSIFICATION

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Lamiales

Family: Pedaliaceae

Genus: *Sesamum*

Species: *indicum*

Local Name: Til

INTRODUCTION

* Sesame is short duration, Kharif season and self-pollinated crop.
* Sesame has been cultivated as a valuable oil crop.
* Its seed contains prime quality of about 50% edible oil, 22% good quality protein and 16-18% carbohydrate.
* Its oil is mixed as a ratio of 5 to 10% with other edible oils for improving their quality.
* Its cost per unit area is lower while its per acre profit is higher so, it is becoming a popular crop.
* It is very drought-tolerant crop. It has been called a survivor crop.

AGRO-METEOROLOGY

Climate: It is irrigated and semi-arid tropic crop and require high temperature of 35-40 oC for vegetative and reproductive growth.

Soil: It can be grown on sandy-loam to clayey soils. However, silt to clay loam soils are best for it.

ECONOMIC IMPORTANCE

Area of Pakistan under Til is 56.10 thousand ha, production 25.48 thousand tonnes and average yield is 402 kg/ha

Uses: Human and animals diet, poultry diet, fast foods and bakery products, quality soaps, perfumes, carbon paper, ribbon of type writer

PRODUCTION TECHNOLOGY

1) Seed bed preparation: 2-3 ploughings, 1-2 planking are sufficient to prepare seed bed.

2) Sowing time: In barani areas: 1st July-15th July; In irrigated areas, 1st June–15th July. Sowing before June affected due to diseases and insects attack After July resulted lower production and delays wheat sowing

3) Seed rate: 1.5 to 2 kg/acre

4) Sowing method: Sowing with automatic rabi drill is best (R X R = 45 cm apart). Ensure that seed placement should be at depth of 2 cm. Seed mixed with 6-8 kg sand or fine soil for drill sowing and continuous mixing for uniform placement of seed. If drill is not available, then seed mixed with 2-3 kg sand and broadcast in length wise and width wise. Than covered with light soil.

The optimum plant population of wheat is 10-12 lac plants per care.

5) Fertilizer:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Areas | Application of fertilizer | N | P2O5 | K2O (kg/acre) |
| Irrigated areas  | At first and second irrigation | 23 | 23 | 12 |
| Barani areas | At the time of sowing |

Fertilizer should be applied according to fertility status of soil (in irrigated areas) and according to rainfall (in barani areas). Less fertile soils require more fertilizer and more rainfall areas require more fertilizer.

In irrigated areas, whole of P and K should be applied at seed bed preparation. But N is applied in 2 splits, ½ N at seed bed preparation and ½ N with 1st or 2nd irrigation.

6) Irrigation: It requires 2-3 irrigations:

1st irrigation: 15-20 days after sowing (DAS)

2nd irrigation: at the time of flowering

3rd irrigation: at the time of pod formation

7) THINNING AND HOEING

* After one week up rooted the weak and diseases plants by keeping 4-6 inch spacing between plants following 58,000 to 87,000 plants/ha.
* First hoeing is done after 15-20 days and second after 30 days of germination with khurpa or Tarphali.

PLANT PROTECTION MEASURES:

1. INSECT-PESTS:

Til Capsule Borer

White Fly

Jassid

Mirid Bug

Cotton Mealy Bug

Thrips

Termite

1. DISEASES:

Stem/Root Rot

Wilt

Collar rot

Phyllody

HARVESTING AND THRESHING

* Sesame crop matures in about 100-120 days
* The crop should be harvested when 75 % capsules are ripened and become (yellow colored)
* Make bundles and stalked upright for drying
* One week after harvesting, thrashing should be done in clear weather so that seeds could also be dried prior to storage with at least 8-10% moisture content

VARIETIES

TH-6; TH-5