3. Secondary tillage equipment

Secondary tillage implements,
- Harrows
- Pulverizes/rollers
- Leveling board
- Cultivators
- Special tools for surface tillage

**Harrows**

A harrow is an implement with spikes or disks that is used to cultivate the soil by pulverizing and smoothing it.

- Disk harrow
- Spike tooth harrow
- Spring tooth harrow

**Disk Harrow:**

![Disk Harrow Image](image1)

**Spike tooth harrow**

![Spike Tooth Harrow Image](image2)
**Spring tooth harrow**

- Suitable forward speed – 5 -10 km/hr
- Maximum depth – 15 cm
- Working capacity – 8 acres/ day

**Disk harrow:**
- Consist with number of small disks
- Disks are arranged as gang
  - Two gang
  - Four gang
- Three types of disk harrows
  - Single action
  - Double action
  - Off set

**Two gang disk harrow:**

**Four gang disk harrow:**
Single action

Offset disk harrow

Double action

Disk bedder

- Two gang disk harrow
- Disk size/concaveness is different
- Use to make race bed
Pulverizes/rollers

Large soil clods convert to tiny soil particles
Can achieve good seed bed

Leveling board

Use to level the field/seed bed
Use for irrigation practices
Use to make roads
Working width – 1.5 – 3 m
The suitable forward speed – 3-5 km/hr

Cultivators

A cultivator is an implement used to loosen the soil and control weeds between rows of growing crops.

Special tools for surface tillage

Sweeps
Swiss hoe
Chopping
Sweepers
Swiss hoe (MI hoe)
Chopping hoe

Ridger and furrow opener

Use to make ridge and furrows

Ridger
make a furrow in an un-broken soil
Heavy implement

Furrow opener
make a furrow in a broken soil
Light implement
Use after rotary tiller
Classification of tillage implements

**Tillage implements**

- **Hand tools**
  - Single blade cultivator
  - Three point cultivator
  - Swis hoe
  - Choping hoe
  - Mamoty
  - Crawbar

- **Animal driven**
  - Village wooden plow
  - Single cattle plow
  - Light iron plow
  - Heavy duty moldboard plow
  - Leveling board

- **Mechanically operated**
  - Two wheel tractor driven primary tillage implements
    - Japanese reversible plow
    - Rotovator
    - Disc plow
Four wheel tractor driven primary tillage implements
   Moldboard plow
   Disc plow
   Sub soiler
   Tine tiller
   Rotovator

Two wheel tractor driven secondary tillage implements
   Rotovator
   Star plow
   spine harrow
   leveling board

Four wheel tractor driven secondary tillage implements
   Rotovator
   Tine tiller
   Disc harrow
   Spine tooth harrow
   Spring tooth harrow

Other implements
   Ridger
   Plow wheels
   Pudding wheels
   Leveler
   Inter cultivator