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IRRIGATION ENGINEERING

[BTAI 2201]

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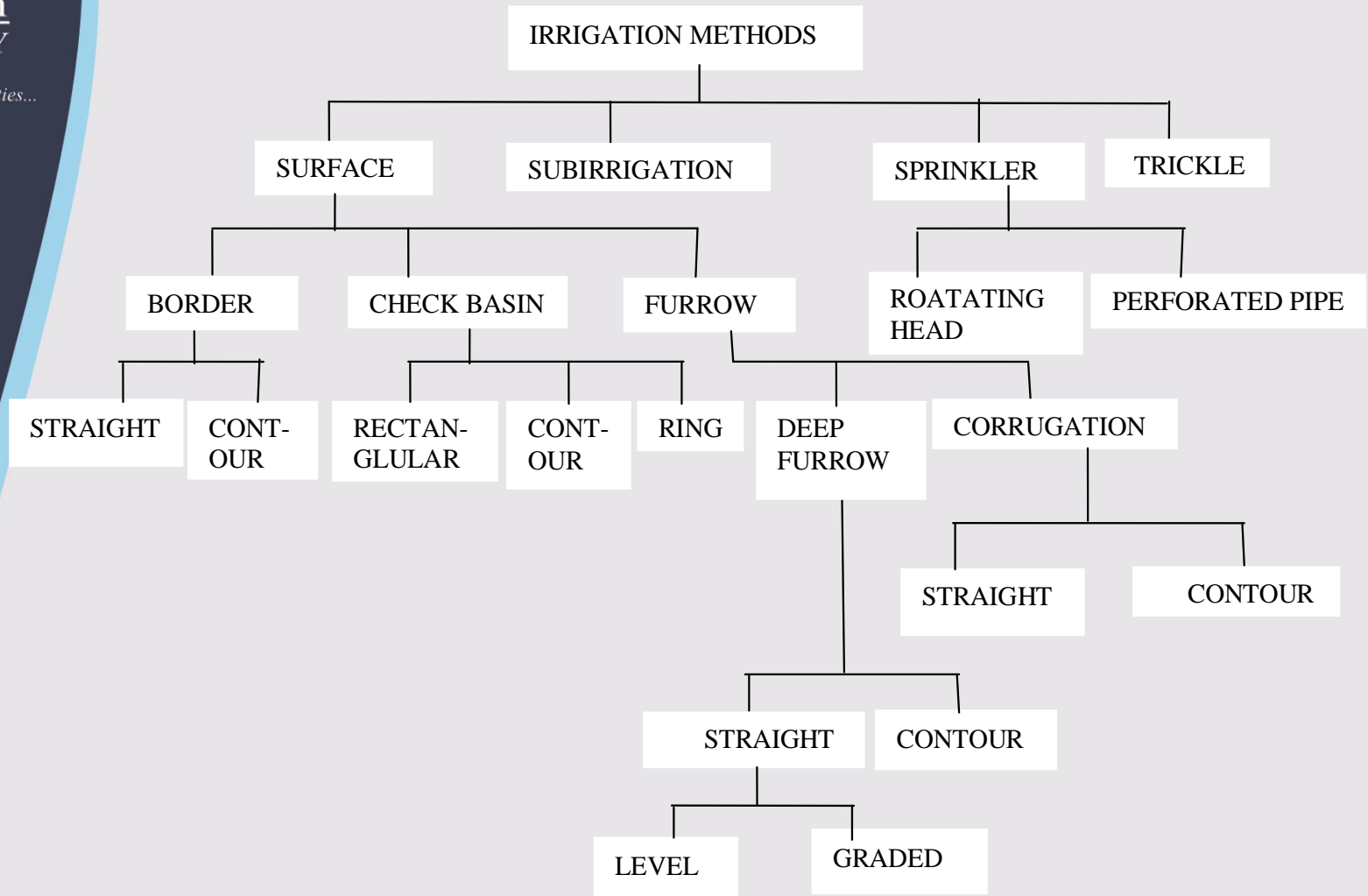
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METHODS OF IRRIGATION





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Surface Irrigation

Surface irrigation method is most widely practiced. This system is suitable for soil having low to medium infiltration rate & works well for soil having relatively uniform terrain. It also works better for land having less than 2% slopes.

Surface irrigation, in general, can be practiced as **uncontrolled or wild flooding & controlled flooding**.

Controlled flooding can be achieved by

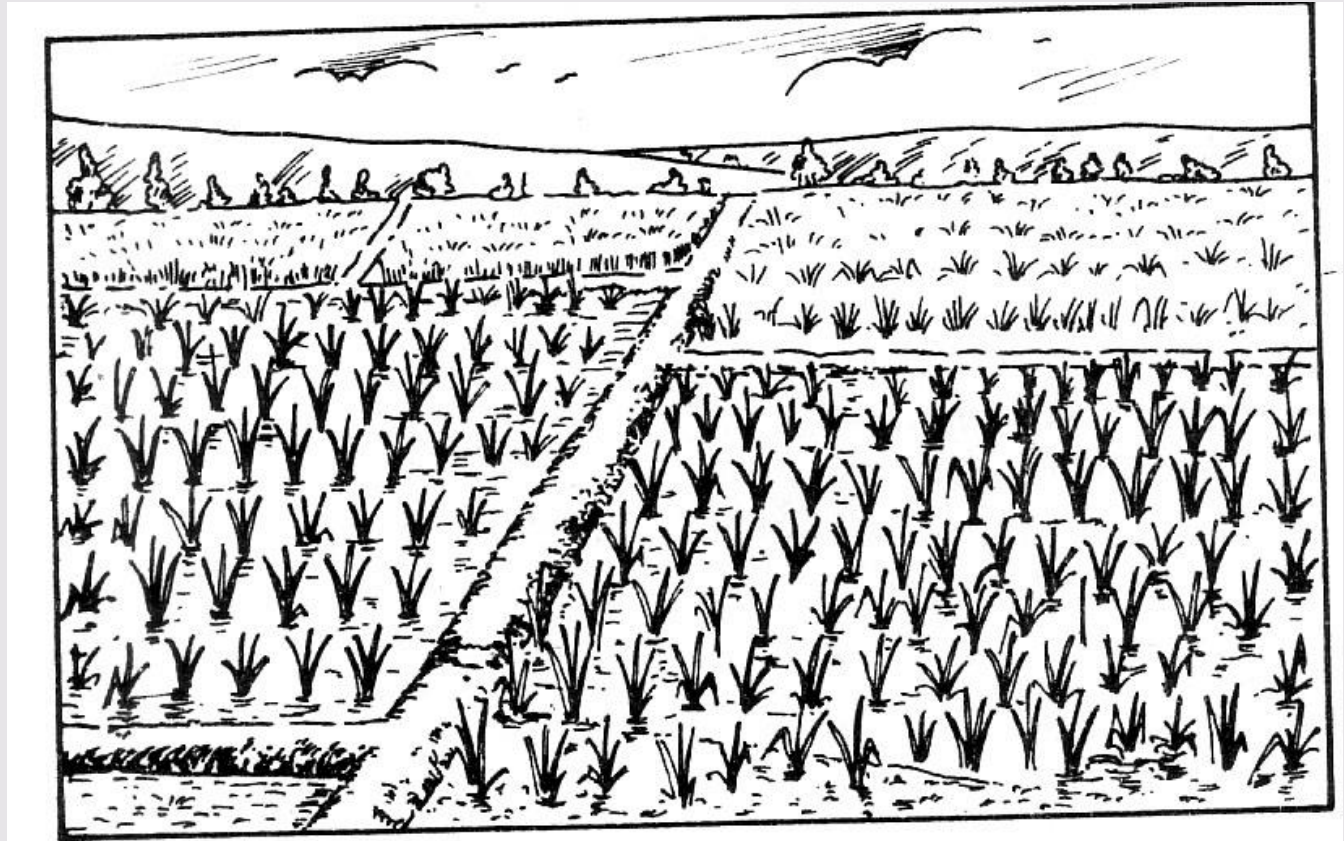
- (i) Free flooding
- (ii) Contour laterals
- (iii) Border strip
- (iv) Checks basin and
- (v) Furrow.



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Uncontrolled/Wild Flooding





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Flooding Method

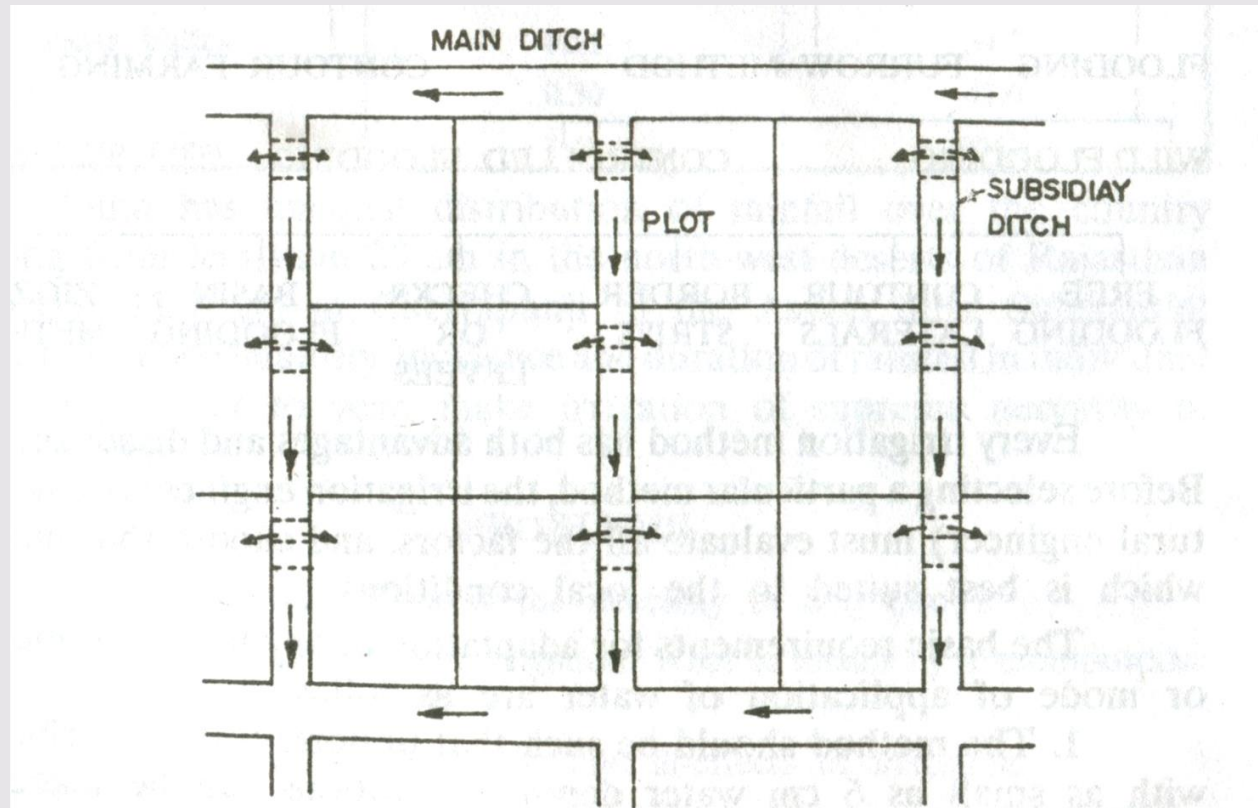


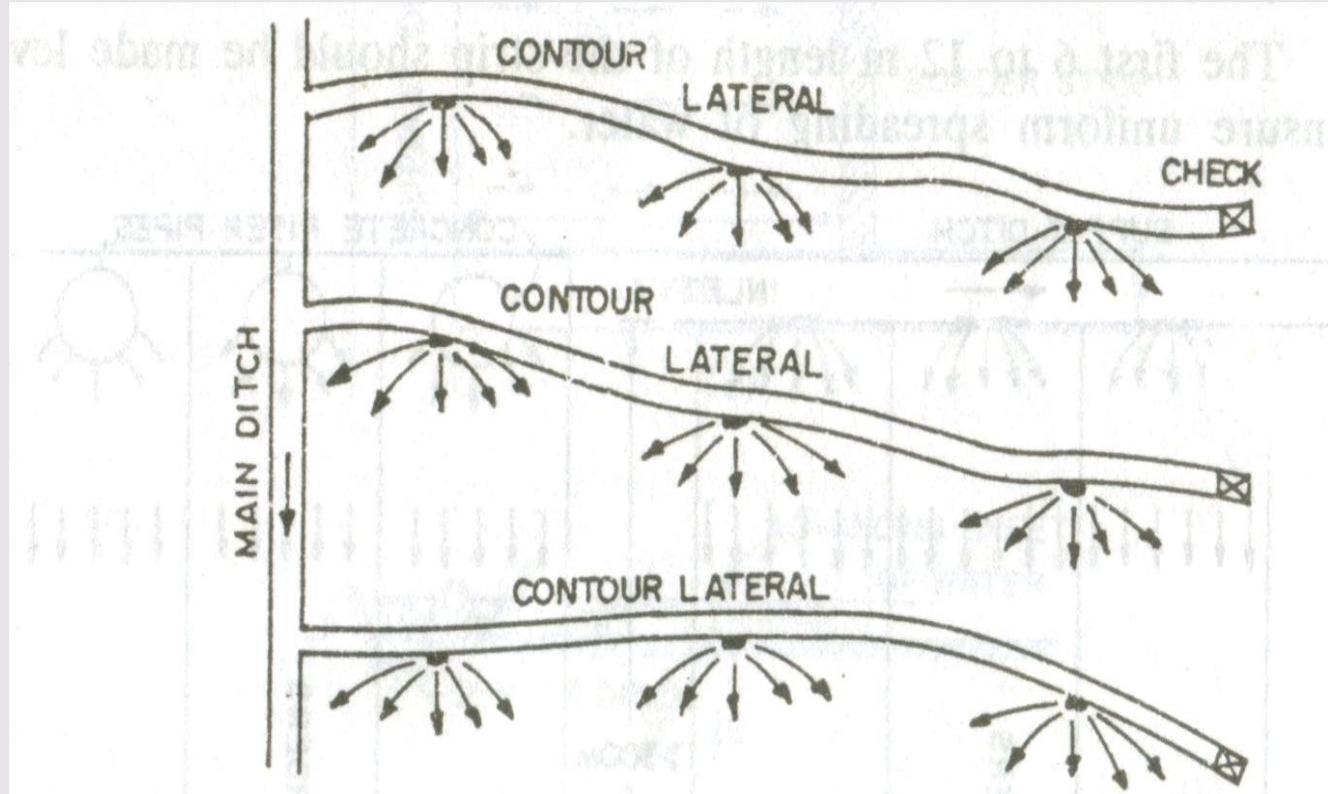
FIG. 2.1 FREE FLOODING METHOD.



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Contour Laterals





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Border Strip Method

Border method of irrigation makes use of parallel ridges to guide water to move down the slope.

Land is divided in to a number of long parallel strips called borders. These strips are separated by low ridges or levees.

Irrigation water is supplied to the border which is allowed to enter from a supply ditch to the head reach of the strip. Water advances in a form of thin sheet towards the downward direction of the strip along the longitudinal slope.

When the advancing water front either reaches the lower end, or a few minutes before that, the stream is cutoff. Water temporarily stored in the border moves down the strip & infiltrates, thus completing the irrigation.

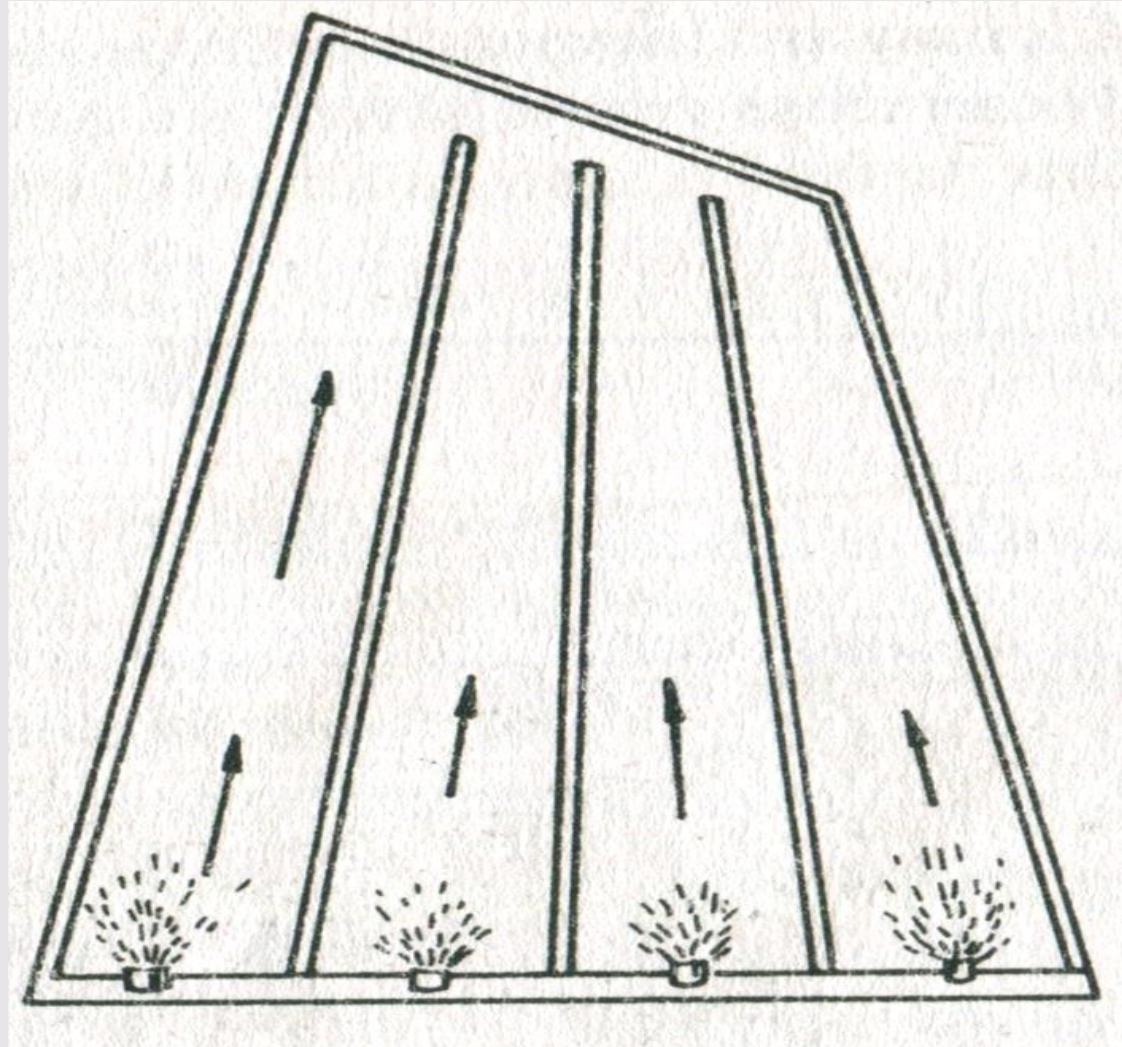
Close growing crops like wheat, pulses, sorghum and forage crops are irrigated by this method.



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Water Movement along a Border Strip





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Advantages of Border Irrigation

- Border ridges can be constructed easily and economically with simple farm implements like a bullock drawn A-frame ridger or bund former or tractor drawn disc ridger.
- Labor requirement in irrigation is greatly reduced as compared to the conventional check basin method of irrigation.
- Uniform distribution and high water application efficiencies are possible if the system is designed properly.
- Large irrigation streams can be efficiently used.
- **Operation of the system is easy and simple.**



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Border Specifications & Stream Size

Width of a border usually varies from 3 to 15 m depending on the size of the irrigation stream & degree of land leveling. If the size of the irrigation stream is small, width can be reduced. Reduction of width less than 3 m is not economical.

Length of the border strip depends on how quickly it can be wetted over its entire length. This, however, depends on (i) infiltration of rate of the soil (ii) longitudinal slope of the field and (iii) available size of the stream. In general, length of the border strip varies from 60 to 120 m for sandy or sandy loam soil, 100 to 180 m for medium loam soil and 150 to 300 m for clay or clay loam soil.

Borders usually have too little or no cross slope. However, they have some longitudinal slopes which is given as :

0.25 to 0.60 percent for sandy loam to sandy soils.

0.20 to 0.40 percent for medium loam soil and

0.05 to 0.20 percent for clay to clay loam soil.



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THANK YOU