TECHNICAL SHEET

Ground contouring technique (ados)

Definitions

- **Contour line:** A contour line (or elevation isopleth) is, in cartography, a line formed by the points of relief located at the same altitude. It is also the line of intersection of a horizontal plane with the relief of the terrain. In mathematics, where the expressions level line or implicit curve are used, it is one of the ways to define the general concept of curve (source: https://fr.wikipedia.org/wiki/Courbe_de_niveau).
- **Ados:** is an earthen embankment used to protect crops from the influence of northern winds and to expose them to the action of the sun. It is also a portion of land that is ploughed to give it the relief of a roof with two or four slopes (source: https://www.larousse.fr/dictionnaires/francais/ados/1182).

Description of the technology

The technology is applied at the scale of the farmer's field and respects land rights. A topographic device, water level, "A" frame etc. can be used to stake out the contour line (IER, JIRCAS, 2012). Thus, it is sufficient to permanently mark the contour line (ados de niveau) so that the farmer can install his ridges and other cultivation methods following the contour line (IER, JIRCAS, 2012). Thus, each ridge becomes a water reservoir that forces maximum infiltration of rainwater, resulting in increased crop production (IER, JIRCAS, 2012). The level ados that are to be permanent are made larger for better legibility in the agricultural landscape (IER, JIRCAS, 2012). Level ados are approximately 1 m wide and 30-50 cm high, and can be made in 3-4 round trips of an oxcart (IER, JIRCAS, 2012).

Level curve performed with the "A" frame

With respect to the "A" frame, one foot is fixed, the other is moved, and the same height of the ground is checked according to the position of the air bubble which should be in the center of the bubble pipe (IER, JIRCAS, 2012). The first foot is then moved at the time the second foot is fixed and the search for the new point continues until the air bubble in the bubble pipe is stabilized (IER, JIRCAS, 2012). The contour lines are thus determined by repeating the same operations until the end of the field (IER, JIRCAS, 2012). Due to the sensitivity and maneuverability of this tool, It is possible to use it in many difficult to access areas, so the "A" frame is suitable for steep slopes (IER, JIRCAS, 2012).

Staking of the contour lines

The contours are then staked out downstream of the guard ditch, starting from the highest point. If the slope is greater than 1.6%, the first curve is drawn with a difference in level of 80 cm (Gigou et al, 1999). If the slope is smaller, 50 m are counted from the high point, following approximately the greatest slope, which allows to define a point of the curve, from which the contour is drawn (Gigou et al, 1999). On the contour lines, a stake is placed approximately every 10 m (Gigou et al, 1999). Staking should be done at the end of the dry season, when the previous year's vegetation has been harvested or cleared, and early enough that the first rains can be used to build the structures without delaying agricultural work (Gigou et al, 1999).

Steps for implementing the contouring technique

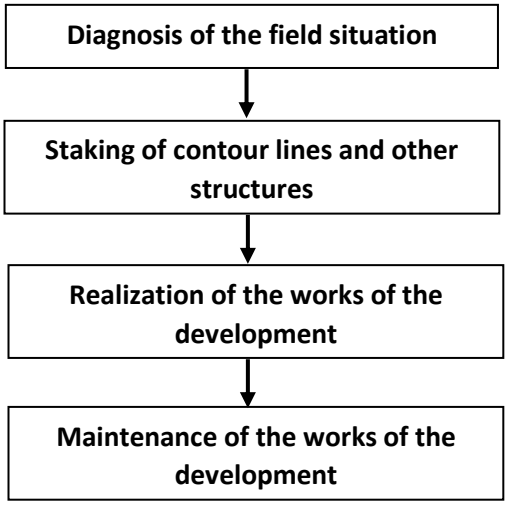

Figure 1 : Implementation stages of the contouring technic (source: IER, JIRCAS, 2012)

Result obtained after staking the contours

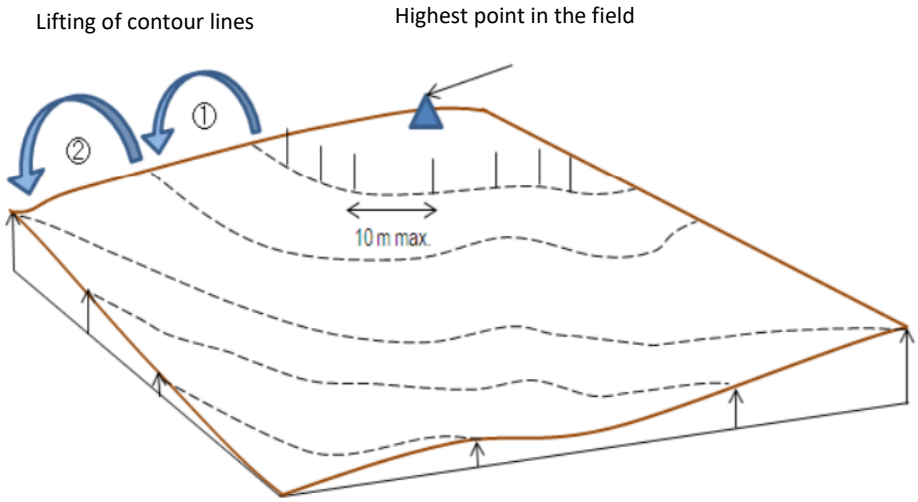

Figure 2 : Schematic representation of contour staking (source: IER, JIRCAS, 2012)

Characteristics of the technology

- Increased water retention in the soil: 25% to 100% of the stock between 60 cm and 120 cm depth.
- Improvement of yields: from 20% to 50%.
- 60% return on investment in the first year.

Bibliographic references

GIGOU J., TRAORE K. B., KOULIBALY H. VAKSMANN M., KOURESSY M. (1999) : Aménagement en courbes de niveau et rendements des cultures en région Mali-sud ; : CIRAD Bamako Mali ; IER-Laboratoire Sol-Eau-Plante Bamako Mali ; 391-404p.

IER, JIRCAS (2012) : Aménagement en courbes de niveau pour la conservation des sols en champs paysans ; Guide pour la gestion et la Conservation des Ressources Naturelles ; 8p.

Web sites consulted

https://fr.wikipedia.org/wiki/Courbe_de_niveau ; 17/08/2021 at 09h44
https://www.larousse.fr/dictionnaires/francais/ados/1182 ; 17/08/2021 at 09h55
https://www.ctc-n.org/sites/www.ctc-n.org/files/UNFCCC_docs/ref10x02_3.pdf ; 17/08/2021 at 10h06
http://www.laboress-afrique.org/ressources/assets/docP/Document_N0958.pdf ; 17/08/2021 at 10h13
https://agritrop.cirad.fr/389449/1/document_389449.pdf ; 17/08/2021 at 10h22
http://www.beep.ird.fr/collect/bre/index/assoc/HASH09db.dir/19-391-404.pdf ; 17/08/2021 at 10h32
https://www.jircas.go.jp/sites/default/files/publication/manual_guideline/manual_guideline-_-_21.pdf ; 17/08/2021 at 10h41

Other references

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