Seedbed preparation

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IWMPRAISE

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Factsheet about integrated weed management

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Introduction

Seedbed preparation is a form of secondary tillage that can control emerged seedlings when performed close to seeding. Using shallow tillage operations, newly emerged weeds are controlled without the use of herbicides. However, seedbed preparation also stimulates new weeds to emerge, resulting in more weed seedlings during early crop growth.

Another important reason for a well-prepared seedbed, could be the advantages for crop emergence and mechanical weeding. Especially fine-seeded crops will benefit from a fine and levelled seedbed as the crop emergence will be more homogenous. In case of mechanical weeding, a well-prepared seedbed makes weeding more effective.

Applicability

Well-timed seedbed preparations can be utilized to control weed seedlings shortly before sowing. In principle, seedbed preparation is applicable for all crops and commonly applied. Very useful when put in place before growing a crop that has slow establishment and/ or has low competitive strength, e.g. onions, leek, carrots, beans or peas.

False seedbed

Seedbed preparation could involve the preparing of a false seedbed. This thorough preparation of the seedbed offers an excellent means of controlling germination of weeds before the crop is sown or planted. The number of weed seedlings during the early crop stages can be effectively reduced. Ploughing the soil (main tillage) stimulates the germination of weeds. Harrowing machinery is often used to control the germinating weeds prior to sowing of planting of the crop.

Depending on soil and weather conditions, if time allows this technique can be repeated several times before sowing of the crop.

When preparing a false seed bed, please consider [1]:

- *Plan sufficient time for a false seedbed. A false seedbed should be established at least ten days before a crop is sown.*
- *Produce a suitable and level seedbed with a fine soil structure. This will simplify sowing, and will reduce the number of weed-control measures.*
- *Timing: A temperature below 10 degrees Celsius will result in lower germination rates of weeds, thus a false seed bed should be prepared at temperatures above 10 degrees Celsius.*
- *Preferably, the cultivation depth should not exceed 2 cm, otherwise further weed seeds will be brought to the surface from deeper soil layers.*
- *False seedbeds can reduce weed seedlings in early crop growth stages. The practice can be repeated as long as the soil and time permit before the cash crop is sown.*
- *By covering the machines that are used for final sowing or planting, light is excluded and will further limit germination of weeds. Most weed seeds are triggered by light to germinate.*

Efficacy

Well executed seedbed preparation results in a reduced weed seedbank[1],[2].

For some weeds however, the use of false seedbeds can result in increased establishment of weeds[3].

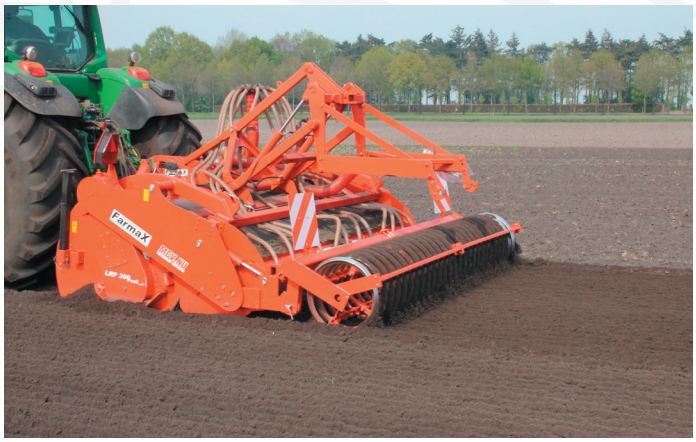

Figure 1| Spitting machine with harrow roller for seedbed preparation.

Costs

Seedbed preparation is a standard operation for most farmers and therefore requires minimal or no investments in equipment. Some extra labour is needed to prepare false seedbeds, but these costs are compensated for by a reduced establishment of weeds resulting is less hand weeding activities. In terms of time investment, the period for seedbed preparation and false seedbeds has overlap with other tillage, sowing and planting activities.

Equipment

The following equipment can be used for seedbed preparation:

- Rotary harrow
- Pasture harrow
- Chain-link harrow
- Full-field hoe

Extra information

See *https://iwmpraise.eu/publications/* for all crop diversification strategies and their definitions, and for more information on integrated weed management.

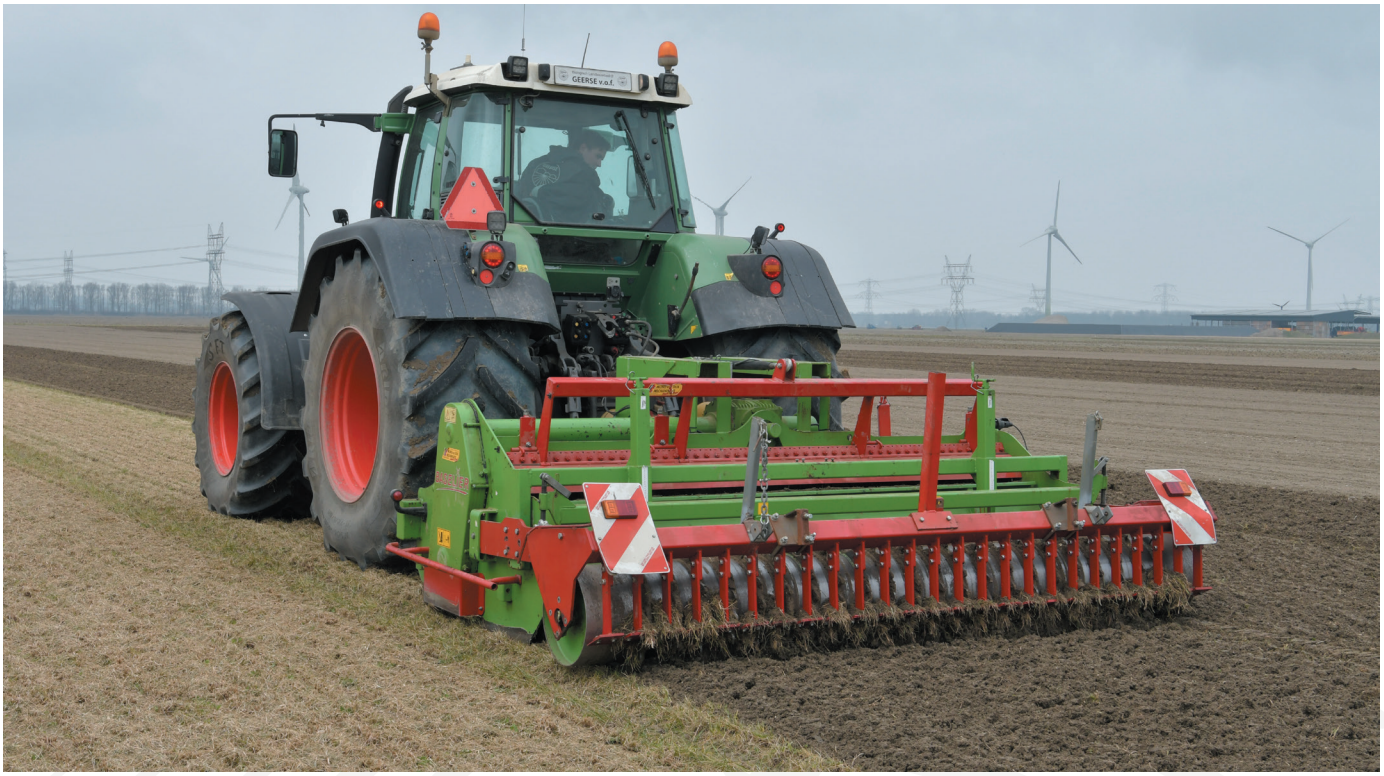

Figure 2| Seedbed preparation using an rotary tiller, which rotates overtop to prevent crop residues ending up in the top layer.

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1| Schans, D., Bleeker, P., Molendijk, L., Plentinger, M., Weide, R., & Lotz, B. Praktisch onkruidbeheer.

2| B. De Cauwer, T. De Cuypere, S. De Ryck, L. Delanote, K. DeWaele, K. Willekens, D. Reheul. Reduction in field emergence and seedbank density of galinsoga quadriradiata and other weeds after contrasting false seedbed strategies in organic vegetable fields. Weed Res., 59 (4) (2019), pp. 265-278, 10.1111/wre.12363

3| M.M. Riemens, R.Y. Van der Weide, P.O. Bleeker, L.A.P. Lotz. Effect of stale seedbed preparations and subsequent weed control in lettuce (cv. Iceboll) on weed densities. Weed Res., 47 (2) (2007), pp. 149-157, 10.1111/j.1365-3180.2007.00554.x

4| Van Der Weide, R. Y., Bleeker, P. O., & Lotz, L. A. P. (2002). Simple innovations to improve the effect of the false seedbed techniques. In Proceedings of 5th EWRS Workshop on Physical and Cultural Weed Control, 3-4.