



No-till seeding in the Mediterranean

Agroecological zones

Cereal Plains

Introduction

No-till seeding is the practice of sowing seeds directly into the soil, without prior ploughing. This technique is used for cereal, vegetable and legume crops. No-till seeding is necessarily associated with no-till or reduced tillage practices. It is also accompanied by a rotation strategy that ensures permanent soil cover by crops or crop residues.

This seeding method is particularly well-suited to agroecological systems and offers many advantages, particularly for cereal crops in the Mediterranean, where it has been the subject of research and dissemination programmes for several years.



Source: INAT, Tunisia

The benefits of No-till seeding

The advantages of No-till seeding derive mainly from the practices of no-till and soil cover. This system (conservation agriculture) preserves soil moisture, which is essential in a Mediterranean climate with frequent dry spells, limits erosion (which preserves soil fertility and limits silting up of dams) and encourages the development of beneficial micro-organisms and soil fauna (earthworms, etc.).

This technique also makes it possible to **sow opportunistically** on existing cover crops or crop residues, as soon as weather forecasts allow. Cereal growers can sow sorghum on cereal straw residues in summer. This provides green cover in summer for livestock farming. This would not have been possible under conventional sowing conditions, where several passes of soil preparation have to precede sowing.

Main crops grown using No-till seeding in Mediterranean environments

No-till seeding is particularly suited to **cereal crops** such as **wheat** and **barley**, which can germinate in less disturbed soil conditions. However, adapting this method to the specificities of the Mediterranean climate requires careful management, taking into account soil texture, climate conditions and production objectives.

No-till seeding is also used in Mediterranean countries for other cereals, such as sorghum, or legumes (chickpea, faba bean, fenugreek).

No-till seeding equipment

No-till seeding requires special seed drills. These seed drills are heavier, enabling seeding to be carried out on soils that are more compact on the surface and often covered with residues. There are two main classes of seed drills:

Disc seeders: The machine is fitted with a disc which opens up the soil to deposit the seed. Only these drills can be used for seeding green cover crops.

Tine drills: These drills may be more appropriate for seeding on plots with high biomass such as straw, as they allow it to be spread out along the sowing line, making it easier for the crop to emerge.



Source: INAT, Tunisia



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Equipment adapted to small-scale farmers in the Mediterranean

Small-scale farmers in the Mediterranean often face challenges in accessing expensive or heavy equipment to implement No-till seeding. Plot size often does not justify the use of conventional no-till drills. There are, however, more compact direct seed drills with narrow working widths, such as those being developed in Tunisia and Algeria in collaboration with ICARDA.

<https://icarda.org/media/blog/locally-made-seeders-are-critical-enablers-conservation-agriculture>.

Challenges and limitations

Farmers in the Mediterranean can face several challenges in adopting No-till seeding and then maintaining this agroecological practice:

- **Initial cost of No-till seeding equipment:** The difficulty of accessing a specific No-till seeding drill at the right time and at a reasonable cost is the biggest handicap mentioned by small and medium-sized farmers wishing to adopt this technique in North Africa. There are, however, financing programmes or collective initiatives (e.g. agricultural cooperatives) that make it possible to pool the costs of purchasing suitable equipment. In Morocco, a national programme to extend No-till seeding to 1 million hectares by 2030 supports farmers and makes seed drills available through cooperatives. In Tunisia, farmers can take advantage of state subsidies for mechanization.
- **Residue management:** Crop residues accumulate in the field and can cause difficulties during sowing or reduce crop emergence. No-till seeding must be combined with an effective residue management strategy, starting with the harvesting of the previous crop. This should include the use of straw shredders (and scatterers), for example, which will have the advantage of reducing the attractiveness of the plots for open summer grazing (a common practice for cereal fields in North Africa). Indeed, once the cereals have been harvested, shepherds can freely graze their animals on the crop residues, which limits soil cover in the dry season. The use of straw shredders or dethatching machines also makes it possible to eliminate straw windrows, which can be a constraint during sowing by altering the placement of seeds at the right depth.
- **Training and awareness-raising:** For farmers to adopt No-till seeding successfully, training and awareness-raising programmes are needed. These programmes can be supported by local institutions, NGOs or agroecological projects.
- **Weed management:** No-till seeding can lead to increased weed growth. Integrated management, including rotations, the integration of **allelopathic species** (which inhibit the growth of other plants, such as sorghum), the use of **cover crops** and **mulching** can help to control this problem. In Tunisia, farmers also use mechanical weeding with curry harrows. However, technical itineraries still often call for the use of non-selective herbicides, which agroecological practices aim to minimize or replace.
- **Soil type:** No-till seeding requires healthy soil with sufficient organic matter to facilitate rooting. It can also be more difficult to implement on compacted or poorly prepared soils. Soil improvement through conservation farming often takes several years. Appropriate technical support is needed to limit the risk of discouragement. Exchanges with peers are also very useful, to gradually set up systems adapted to local soil and climate conditions and to the farm's objectives.



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