



No-till field day in Benahmed region. The sign says: Trial with barley, direct seeding

## Applied research and knowledge transfer (Marrocos)

### DESCRIÇÃO

**Innovative, cross-disciplinary community-based approach for development and transfer of no-till technology at the farm level.**

**Aims / objectives:** After 15 years of on-station research at the National Institute of Agricultural Research (INRA), testing and evaluation of no-till technology (NTT) at farm level started in 1997 with three pilot farmers. Recently two new projects were established to promote the introduction and adoption of NTT, in collaboration with the regional council and extension service of the Ministry of Agriculture (MoA). Fourteen pilot farmers are now involved in NTT. The overall purpose is to promote no-till technology to restore soils, improve production, mitigate drought, increase wealth and strengthen farmers' organisations. NTT has been shown to be socially, economically and ecologically adapted to the local conditions. The approach has three stages: (1) Initiation: this includes basic research, strategic research and applied research; (2) Consolidation: planning is followed by detailed evaluation of technology adoption on farmers' fields; (3) Maturity: this involves the acceptance/spread of NTT with an increased number of farmers in the future.

**Methods:** INRA carries out research, information dissemination, gives training to technicians and farmers, and provides both technical assistance and monitoring. The regional council was convinced by the technology and now financially supports research activities, drill manufacture and extension of NTT. It also facilitates contacts with decision makers and farmers, and carries out evaluations. MoA development and extension services provide financial support, advice, technical assistance, and logistical support to farmers: they help to make the drills available. NGOs are engaged in the development of local/regional networks and farmers associations, as well as in funding and providing incentives. Farmers themselves are involved in the implementation, evaluation and dissemination of NTT. Participation, cross-discipline and bottom-up planning are key elements of the approach. Methods for implementation include long-term community on-farm trials, on-site training and information exchange, participation of stakeholders, information dissemination tools, and multi-directional knowledge flow. These are supplemented by intensive measurement/monitoring schemes, establishment of local/regional networks and farmers' association creation. On-the-job training is also provided.

### LOCALIZAÇÃO



**Localização:** Chaouia/Ouardigha, Marrocos

#### Geo-referência de locais selecionados

• -7.606, 32.959

**Data de início:** 1997

**Ano de término:** n.a.

#### Tipo de abordagem

- Tradicional/Indígena
- Iniciativa/Inovação local recente
- Baseado em projeto/programa



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Barley samples from on-farm plots at Khourigba, showing improved growth under no-till technology compared with conventional farming.

## OBJETIVOS DE APROXIMAÇÃO E AMBIENTE PROPÍCIO

### Principais metas / objetivos da abordagem

The Approach focused mainly on SLM with other activities

- spread the no-till technology: thereby enhancing soil productivity and reducing susceptibility to land degradation. - develop the production of no-till drill machinery. - generally: to ameliorate the living conditions of rural people through enhancing expertise, capacities and knowledge of farmers in managing their soils and crops

The SLM Approach addressed the following problems: - previous absence of an integrated research and extension programme. - lack of technical options in a harsh and risky environment. - underlying problems of land degradation and drought periods

### Condições que permitem a implementação da Tecnologia(s) aplicada(s) sob a Abordagem

### Condições que dificultam a implementação da Tecnologia(s) aplicada(s) sob a Abordagem

- **Normas e valores sociais/culturais/religiosos:** Over-reliance on traditions in soil management; attitudes of farmers towards conventional tillage need challenging through information about alternatives. Treatment through the SLM Approach: Training, video conferences, travelling workshops, etc.
- **Disponibilidade/acesso a recursos e serviços financeiros:** Lack of specific funds, credit, loans for investment in new machinery Treatment through the SLM Approach: Prioritise funds for no-tillage development
- **Quadro institucional:** Extension service are not well incorporated in the approach due to lack of knowledge/information on no-tillage Treatment through the SLM Approach: Special Training program; change of institutional thinking upon no-tillage systems
- **Quadro jurídico (posse de terra, direitos de uso da terra e da água):** lack of SWC-related laws Treatment through the SLM Approach: Recommendations on laws to cover SWC technologies. The existing land ownership, land use rights / water rights moderately hindered the approach implementation small size of field requires integration of farmers for using no-till drill and other equipment
- **Conhecimento sobre GST, acesso a suporte técnico:** Lack of adapted machinery Treatment through the SLM Approach: Promotion of no-till drill industry in Morocco

## PARTICIPAÇÃO E PAPEL DAS PARTES INTERESSADAS ENVOLVIDAS

### Partes interessadas envolvidas na abordagem e seus papéis

Que partes interessadas/órgãos de implementação estavam envolvidos na abordagem?	Especifique as partes interessadas	Descreva o papel das partes interessadas
Usuários de terra/comunidades locais		
Organizações comunitárias	Existing groups of land users	
Especialistas em GST/ consultor agrícola		
Governo nacional (planejadores, responsáveis pelas decisões)	INRA	

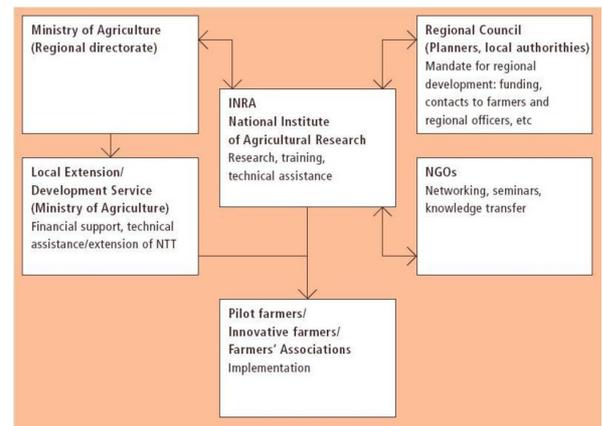
## Envolvimento do usuários de terra/comunidades locais nas diferentes fases da abordagem

	Nenhum	Passivo	Apoio externo	Participativo	Automobilização
Iniciação/motivação		✓			
Planejamento			✓		
Implementação			✓		
Monitoramento/avaliação			✓		
Research				✓	

Mainly: public meetings; partly: workshops/seminars; open days  
 Mainly: workshops/seminars; partly: public meetings  
 Mainly: responsibility for minor steps; partly: casual labour  
 Mainly: interviews/questionnaires; partly: measurements/observations; field observations  
 on-farm; demonstration plots

## Fluxograma

Institutional framework: Stakeholders and their roles: cross-disciplinary linkages between INRA, collaborating institutions and farmers.



## Tomada de decisão sobre a seleção da Tecnologia GST

As decisões foram tomadas por

- Somente usuários da terra (iniciativa própria)
- Principalmente usuários da terra, apoiados por especialistas em GST
- todos os atores relevantes, como parte de uma abordagem participativa
- Principalmente especialistas em GST, após consulta com usuários da terra
- Somente especialistas em GST
- Políticos/líderes

As decisões foram tomadas com base em

- Avaliação de conhecimento bem documentado de GST (tomada de decisão baseada em evidências)
- Resultados de pesquisa
- Experiência pessoal e opiniões (não documentado)

## SUPORTE TÉCNICO, REFORÇO DAS CAPACIDADES E GESTÃO DO CONHECIMENTO

As seguintes atividades ou serviços têm sido parte da abordagem

- Reforço das capacidades/ formação
- Serviço de consultoria
- Fortalecimento da instituição (desenvolvimento organizacional)
- Monitoramento e avaliação
- Pesquisa

## Reforço das capacidades/formação

Foi fornecido treinamento às seguintes partes interessadas

- Usuários de terra
- Equipe de campo/consultores extensionists/trainers, politicians/decision makers, planners

Tipo de formação

- Em exercício
- Agricultor para agricultor
- Áreas de demonstração
- Reuniões públicas
- Cursos

Assuntos abordados

no-tillage system, weed control, machinery, cropping systems, crop variety

## Serviço de consultoria

Foi prestado um serviço de consultoria

- nas áreas dos usuários da terra
- Em centros permanentes

Key elements: Participation of extension agents and farmers / observations (on the crop, weeds, disease, seeding condition, yield components), On-job training / open days (field days to make farmers and extension discuss questions / remarks regarding no till technology, Monitoring/Participatory; 1) Advisory service was carried out through: government's existing extension system 2) Advisory service was carried out through: government's existing extension system; Extension staff: mainly government employees 3) Target groups for extension: land users; Activities: demonstration, field days, traveling workshops

Advisory service is inadequate to ensure the continuation of land conservation activities; Extension Agents need training

## Fortalecimento institucional

As instituições foram fortalecidas / estabelecidas

- Não  
 Sim, pouco  
 Sim, moderadamente  
 Sim, significativamente

no seguinte nível

- Local  
 Regional  
 Nacional

Descreva instituição, papéis e responsabilidades, membros, etc.

Tipo de apoio

- Financeiro  
 Reforço das capacidades/ formação  
 Equipamento

Mais detalhes

## Monitoramento e avaliação

Bio-physical aspects were regular monitored by 0 through measurements Technical aspects were regular monitored by 0 through measurements Socio-cultural aspects were ad hoc monitored by 0 through observations Economic / production aspects were regular monitored by 0 through measurements; Area treated aspects were ad hoc monitored by 0 through observations No. of land users involved aspects were regular monitored by 0 through measurements Management of Approach aspects were ad hoc monitored by 0 through observations; There were no changes in the Approach as a result of monitoring and evaluation: The evaluation is still in process: thus too early to state what changes are likely.

## Pesquisa

As pesquisas trataram dos seguintes tópicos

- Sociologia  
 Economia/Marketing  
 Ecologia  
 Tecnologia  
 agronomy
- crop performance, soil analysis, no-till drill design and evaluation, socio-economic indexes of NTT.
- Research was carried out both on station and on-farm

## FINANCIAMENTO E APOIO MATERIAL EXTERNO

Orçamento anual em USD para o componente GST

- < 2.000  
 2.000-10.000  
 10.000-100.000  
 100.000-1.000.000  
 > 1.000.000
- Precise annual budget: n.a.

Approach costs were met by the following donors: government (national - INRA/Ministry): 80.0%; local community / land user(s) (Regional Council): 20.0%

Os seguintes serviços ou incentivos foram fornecidos aos usuários de terras

- Apoio financeiro/material concedido aos usuários da terra  
 Subsídios para insumos específicos  
 Crédito  
 Outros incentivos ou instrumentos

Apoio financeiro/material concedido aos usuários da terra

Equipamento: Maquinário

Parcialmente financiado  
Totalmente financiado



Agrícola: Sementes



Agrícola: Sementes: Fertilizantes



biocides



A mão-de-obra dos usuários da terra foi

- Voluntário  
 Comida por trabalho  
 Pago em dinheiro  
 Recompensado com outras formas de apoio material

## Crédito

Condições: repayment conditions: To promote the acceptance of the technology, farmers receive a 50% subsidy on the purchase price of the no-till drill (as is the general case for all types of drills).

Fornecedores de crédito: n.a.

Receptores de crédito: n.a.

## ANÁLISE DE IMPACTOS E DECLARAÇÕES FINAIS

Impactos da abordagem

Não  
Sim, pouco  
Sim, moderadamente  
Sim, significativamente

A abordagem auxiliou os usuários da terra a implementar e manter as tecnologias de GST?



Better use of the rainwater stored in the soil by crops leads to improvement of soil and water management: increase in soil organic matter has multiple benefits.

A abordagem melhorou as questões de posse de terra/diretos do usuário que inibiam a implementação das tecnologias de GST?



The land is a private property and can not be affected by no-tillage but with no-tillage farmers can rent or buy new lands for adoption of more no-tillage.

Did other land users / projects adopt the Approach?



This no-till system can now be considered for several different agroecological situations where a similar approach can be applied (e.g. flood control project, agro-forestry program, soil restoration project, etc.).

### Principal motivação dos usuários da terra para implementar a GST Atividades de sustentabilidade de abordagem

n.a.

Os usuários da terra podem sustentar o que foi implementado através da Abordagem (sem apoio externo)?

- Não
- Sim
- Incerto

Progress can continue to be made, assuming that training, subsidised drills, and the creation of farmers' organisations all persist.

## CONCLUSÕES E EXPERIÊNCIAS ADQUIRIDAS

### Pontos fortes: visão do usuário de terra

- Adaptability to farmers needs/constraints (How to sustain/ enhance this strength: Include integration of livestock and crops. This should be helpful to pursue in the approach)
- Farmer's decisions, opinions, critics (How to sustain/ enhance this strength: Bottom-up maintained (gradually))
- Incentives make it possible for land users to experiment with a new cultivation system (How to sustain/ enhance this strength: Diversification of incentives: eg reduction in seed prices and herbicides for NTT farmers; award - NTT best producers; reduction in interest rates for NTT farmers (for credits or loans); special NTT training courses.)

### Pontos fortes: a visão do/a compilador/a ou de outra pessoa capacitada

- The NTT project has integrated several institutions -which is unique in Morocco. Now research, extension, community and farmers are working together towards the same objective (How to sustain/ enhance this strength: Further develop, refine and spread NTT)
- NGOs development: the association of NTT farmers and environmental clubs are important for spreading NTT and for reinforcing the importance of NTT amongst government officers and decision makers (How to sustain/ enhance this strength: special NGOs should be encouraged to respect soils, nature, environment)
- Cross-discipline: involving land users, research and extension agents has helped in building up an approach suitable for the local conditions. (How to sustain/ enhance this strength: The working teams received also incentives and recognitions)
- research connected to extension (How to sustain/ enhance this strength: research should be developed to get continuous measurements/information and to search new indexes and means)
- Progressive implementation of a 'bottom-up' approach; integration of farmers' decisions, opinions and criticisms (How to sustain/ enhance this strength: Farmers and their association are involved gradually in the approach and their critics, comments, feedbacks respected)

### Pontos fracos/desvantagens/riscos: visão do usuário de terracommo superar

- Information availability: up to now information and communication on NTT is scarce intensify training of trainees
- In some situations (farmers with very low incomes), the need for external inputs such as herbicides, seeds, fertilizers and drills may retard implementation of NTT Incentives should be maintained for a short period and supplemented by credit systems.

### Pontos fracos/desvantagens/riscos: a visão do/a compilador/a ou de outra pessoa capacitadacommo superar

- Direct incentives: there is always a risk that when eliminating these incentives, farmers will abandon NTT Eliminate incentives gradually and replace with loans and credits.
- The programme's duration is currently too short to overcome resistance (to new technology adoption) and to address economic constraints of farmers A long term programme is needed to increase acceptance among farmers.

## REFERÊNCIAS

**Compilador/a**  
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### Pessoas capacitadas

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### Descrição completa no banco de dados do WOCAT

[https://qcat.wocat.net/pt/wocat/approaches/view/approaches\\_2355/](https://qcat.wocat.net/pt/wocat/approaches/view/approaches_2355/)

### Dados GST vinculados

Technologies: Технология нулевой обработки почвы [https://qcat.wocat.net/pt/wocat/technologies/view/technologies\\_1253/](https://qcat.wocat.net/pt/wocat/technologies/view/technologies_1253/)

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Technologies: Drainage Biofilter [https://qcat.wocat.net/pt/wocat/technologies/view/technologies\\_6259/](https://qcat.wocat.net/pt/wocat/technologies/view/technologies_6259/)

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Projeto

- Book project: where the land is greener - Case Studies and Analysis of Soil and Water Conservation Initiatives Worldwide (where the land is greener)

### Referências-chave

- Wall et al, 2002, Institutional aspects of conservation agriculture, International workshop on conservation agriculture for sustainable wheat production, 14-18, october 2002, Tashkent, Uzbekistan: p.wall@cgiar.org
- Segry, L.; Bouzinac, S and Pieri, C. 1991: An Approach to the development of sustainable farming systems. World technical paper N-2, ISBRAM proceedings 1991:

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