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ECONOMIC AND SOCIAL COUNCIL

Economic and Social Commission for Western Asia (ESCWA)

Expert Group Meeting on Sustainable Land Management
as a Best Practice to Enhance Rural Development
in the ESCWA Region
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Sustainable Agriculture No-Till Farming

by

Mr. Isam Isa Bashour
Ms. Roula Bachour, Mr. Kassem Jouni
Faculty of Agricultural and Food Sciences
American University of Beirut (FAFS/AUB)

Lebanon

Sustainable Agriculture
No-Till Farming

Isam Bashour
Roula Bachour
Kassem Jouni

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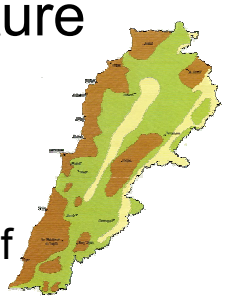
Lebanese Agriculture



- Contributes about 10% to GDP
- Source of income to about 20% of population
- About 195,000 farmers of which 66% have another job
- Employs about 9% of the total work force

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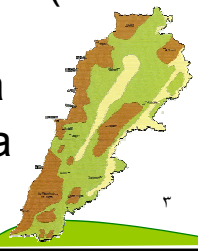
Lebanese Agriculture cont'd

- About 248,000 ha (1999), 24% of Lebanon territory
  - 42% irrigated
  - 2% controlled environment
- Beqaa : 39% of total cultivated area (66% irrigated)
- North: 26% of total cultivated area
- South: 23% of total cultivated area



Agricultural Land by Farm Size

Exploitable Agricultural Lands by Farm Size Category (10 dunum = 1 ha)

Farm size category (in dunum)	Percent of farmers	Percent of total cultivated area
Smaller than 5	53.0	9%
5-100	45.4	61%
Larger than 100	1.6	30 %

Source: MoA/FAO, 2000

Water Resources

- Raining season: September-April (about 80 rainy days)
- Annual precipitation varies: 200-1500 mm
- Water Losses: Run off and evaporation > 70%
- Usage by Agriculture: more than 2/3, water shortage is expected in the future

Soil Resources

Some Agricultural soils are threatened by:

- Water erosion
- Wind erosion
- Salinization: bad irrigation practices
- Pollution: irrigation with contaminated water
- Urbanization: converting agricultural land into housing complexes.

Soil and water management

- Introduction of proper plan is essential to:
  - Maintain agricultural land
  - Maintain soil fertility
  - Maintain soil productivity

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NT-CA experiment

- The introduction of No-Till leading to the application of Conservation Agriculture (CA): to introduce a more sustainable agricultural production system started 2 years ago.
- AUB+LARI : funded by GTZ

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Farmers till the land to:

- Prepare adequate seedbed
- Control weeds
- Improve aeration
- Increase water infiltration
- Prepare furrows for irrigation
- Incorporate residues and fertilizers

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Reduced tillage + No-Till

- Less fuel (50% or less)
- Less time
- Less soil erosion
- Less soil compaction
- Requires farmers education

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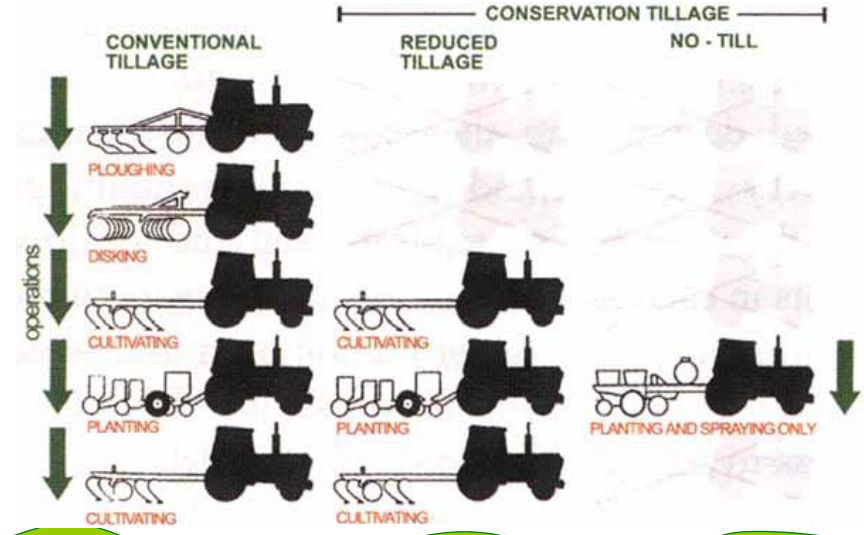
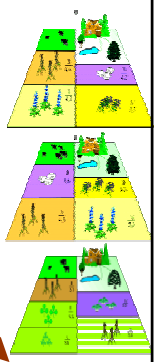


In Lebanon

- No research comparing different tillage methods
- No research on various types of crops and orchards.

CA system



Reduced or no-tillage

Conservation agriculture

Soil cover

Crop rotation

Ecological Advantages (Soil Protection)

- Highest Soil Stability
- Undisturbed fauna and flora
- Natural Soil Structure
- Increasing Organic Matter
- Reducing Erosion
- Higher soil activity

Ecological Advantages (Water Protection)

- Increased water holding capacity of soil
- Higher Infiltration Rate
- Decrease Leaching of nutrient residue
- Reduce soil erosion into rivers
- Reduction of Evaporation

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Ecological Advantages (Climate Protection)

- Minimal Use of Fuel
- Less CO_2 loss into the atmosphere
- Fixation of Carbon via mulch degradation

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Ecological Advantages (Highest Economy)

- Highest Mechanical Efficiency
- Less time for land preparation
- Less Machinery deterioration
- Less Fuel Consumption

Difficulties

- No-Till system are harder to implement
- Farmers are afraid of lower yields
  → resist the change
- Need new machinery (New Investment)
- The will of single farmer to protect his resources is low

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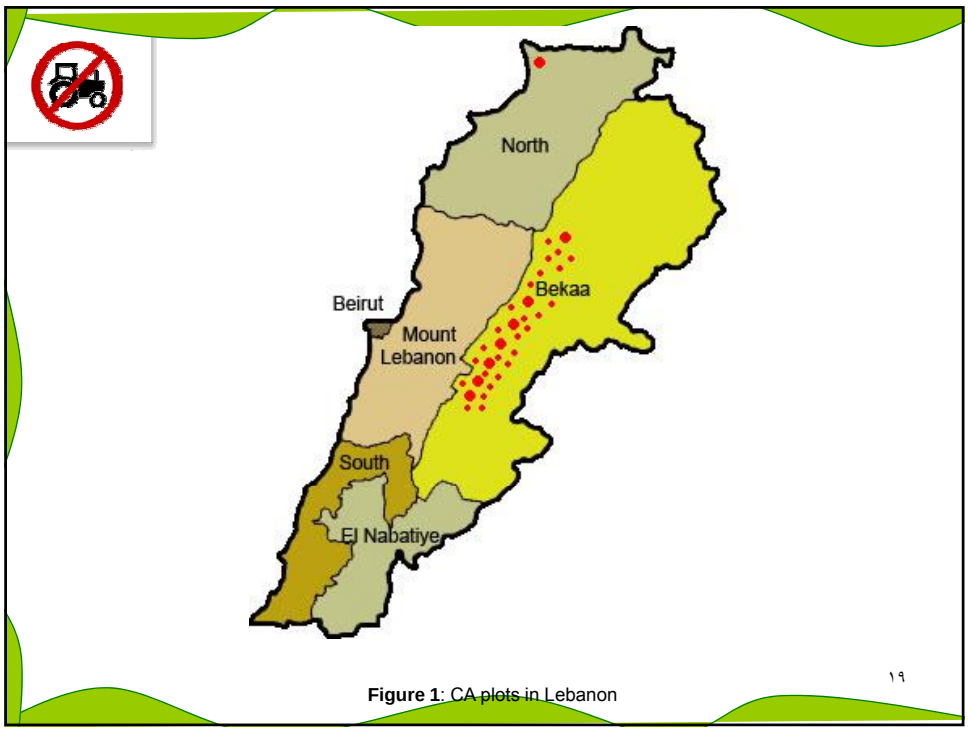
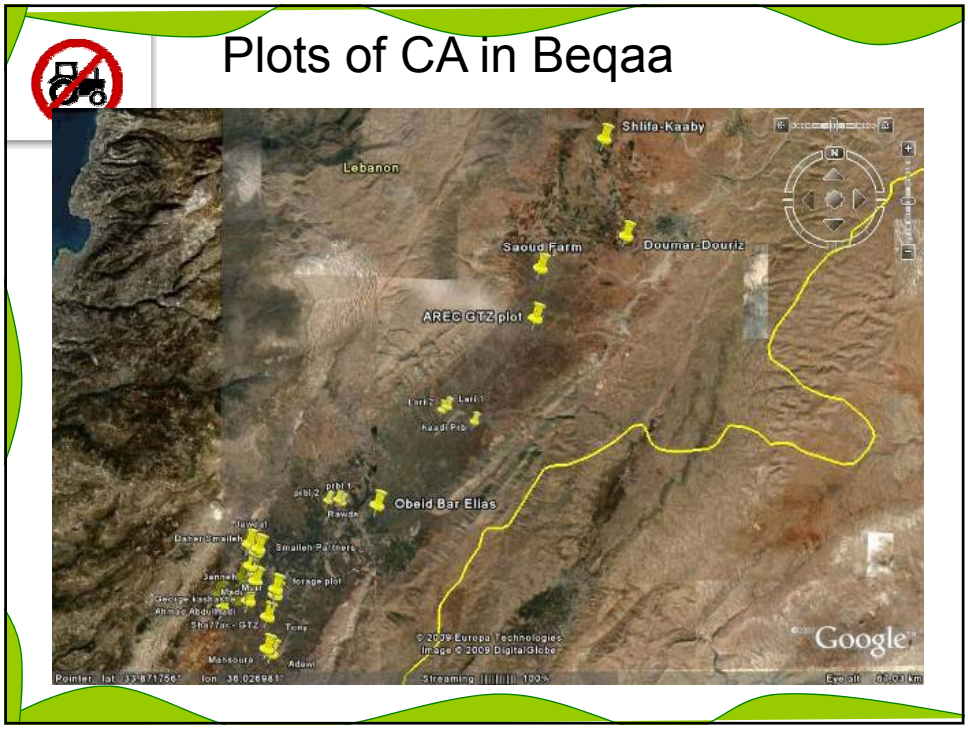


Figure 1: CA plots in Lebanon



Plots of CA in Ammik

Soil moisture content during the summer at AREC

Depth (cm)	8-May-08		7-Jun-08		8-Jul-08	
	Conventional	No-Till	Conventional	No-Till	Conventional	No-Till
0-15	23.6%	24.1%	12.3%	13.6%	7.7%	9.2%
15-30	25.4%	25.1%	18.1%	20.0%	13.0%	16.2%
30-45	27.6%	28.0%	25.7%	28.3%	23.6%	26.0%
45-60	30.2%	31.1%	28.1%	29.0%	26.8%	28.0%
Average	26.70%	27.08%	21.05%	22.73%	17.78%	19.85%

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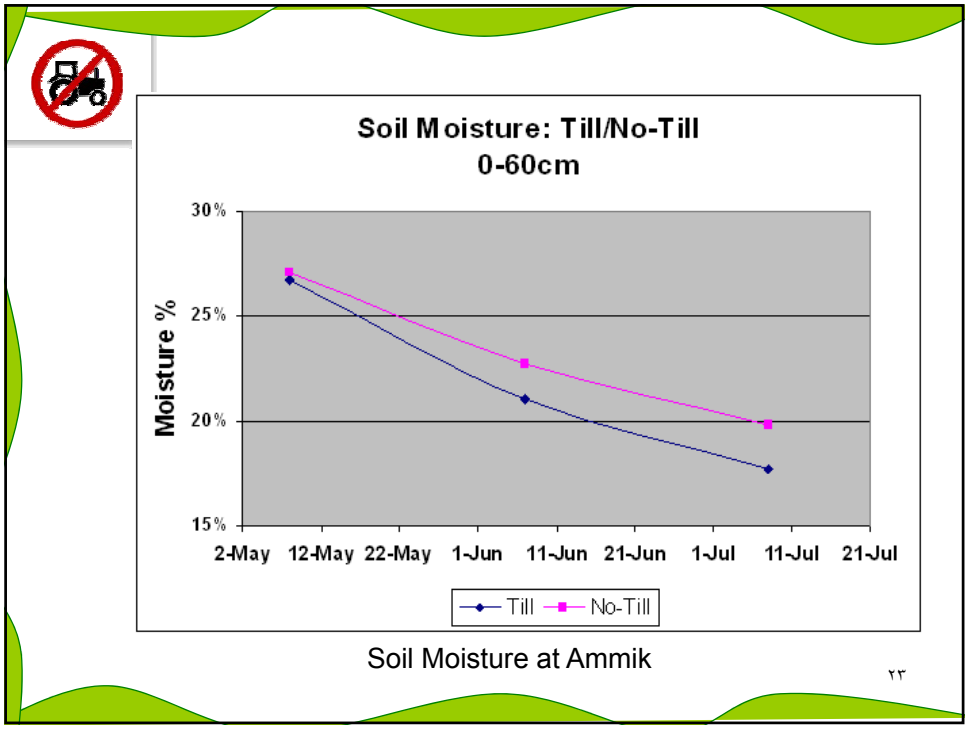

Soil Moisture at Ammik

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Skaff Farm – Ammik
June 10, 2008

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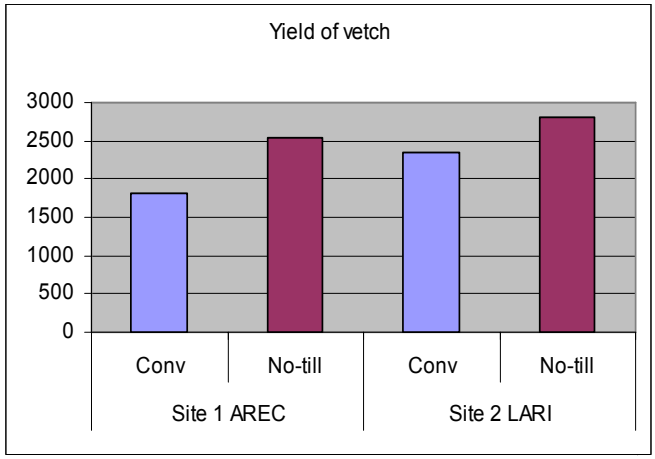
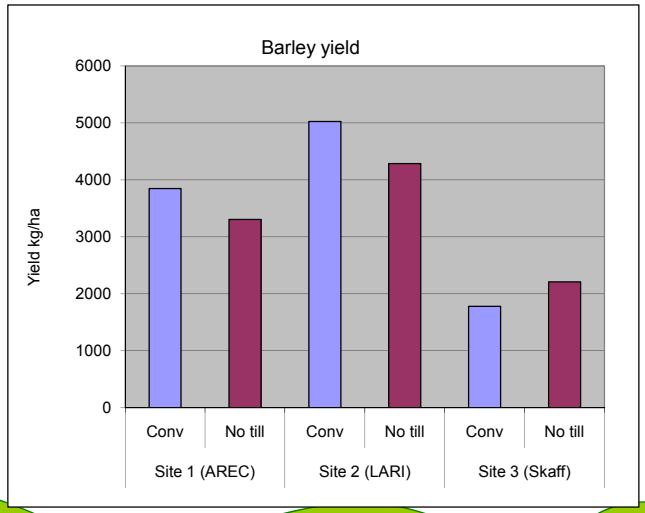
Yields of vetch crops at AREC & LARI



Yields of barley at AREC, LARI, & Ammiq



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New Brazilian Fankhauser No-till seeder/planter offered by GTZ

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Barley (no-till) at AREC 24-12-07

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No-till Field Conventional field

Corn Field at Ammik 10-7-08

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Germination at AREC (no-till plot)

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Ammik experimental plot, Chahhar, germination (Conv on the left and No-till on the right)

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List of Farmers

	Names of the farmers	Planted Area (Du)	Location		Names of the farmers	Planted Area (Du)	Location
1	AREC-AUB	40	Haoush Sneid	19	Ghassan El Murr	100	Amik
2	Abdo Aadawi	100	Ghaza		Spiridon El Murr	100	Amik
3	Daher Smayli	10	Amik	20	George Doumar / Alfalfa	100	Douress
4	Skaff plot (Chahhar)	100	Amik		Joseph Doumar / Alfalfa	50	Douress
5	LARI (plot 1)	10	Tal Amara	21	Wajih Maroun	100	Amik
6	LARI (plot 2)	10	Tal Amara		Paul Maroun	40	Amik
7	Saoud Farm	7	Tarayya	22	Daher Smayli	100	Amik
8	Isam Fares/Arida	20	Arida-North	23	Abdallah Moudawar	100	Amik
9	Daniel Moudawar	100	Amik	24	Fadi Chekiyeh	50	Amik
	Saadallah Moudawar	100	Amik		Nabil Ghazal	75	Amik
	Charbel Moudawar	100	Amik	25	Rony Bou Aaneh	100	Amik
	Diab Moudawar	40	Amik		Michel Chamass	100	Amik
10	Amin Abed Al Hadi	100	Amik		Samir Chamass	100	Amik
	Marwan Abed Al Hadi	100	Amik	26	Fouad Hussein	100	Amik
	Ahmad Abed Al Hadi	80	Amik		Mustafa Abdo	100	Amik
11	Abdallah Jedaan	80	Taanayel		Antoine Bou Aaneh	100	Amik
12	Elie Abou Akel	100	Taanayel		Nazih Bou Aaneh	100	Amik
	Fouad Freiha	100	Taanayel		Makhoul Bou Aaneh	100	Amik
	Gerges Abou Akel	100	Taanayel		Rabih Hussein	100	Amik
	Mounir Freiha	80	Taanayel	27	Mohamed Smaily	100	Amik
13	Daher Kaadi	100	Rayak		Hussein Smaily	75	Amik
	Elie Kaadi	100	Rayak		Mahmoud Smaily	50	Amik
	Antoine Kaadi	70	Rayak	28	Khaled El-Kaaby	40	Chlifa
	Kaadi Kaadi	45	Rayak	29	Abd Raouf Adawi	50	Jeb Janine
14	Sami Dahdouh	100	Amik		Ahmad El Orra	50	Jeb Janine
	Ihab Dahdouh	100	Amik		Khaled Hussein Adawi	100	Jeb Janine
15	Georges Kachachi	100	Amik	30	Hussein Obeid	33	Barelias
	Abdallah Hammoud	100	Amik	31	Bachar Khoury	100	Rawdah
	Naser Hatoum	100	Amik		Miled Ziadeh	100	Rawdah
16	Toni Madi	40	Amik		Assaf Akrouch	100	Rawdah
17	Abdel Hakim Al Majzoub	75	Amik	32	Mounir Khamis	100	Amik
	Aziz El Murr	100	Amik		Aziz Khamis	100	Amik
18	Jawdat Bou Aaneh	100	Amik	33	Tony Khoury	100	Mansoura
	Marc Bou Aaneh	100	Amik		Georges Khoury	100	Mansoura
					Elias Khoury	100	Mansoura
	Total				5,620		

- Many calls from farmers to join the program next year
- Field days are planned : Spring and at harvest
  - Farmers
  - Extension personnel MOA
  - Private sector
- To be able to continue at larger scale
- Two planters are needed (limited funding)
  - Small grain
  - Coarse grain

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Conclusion

- CA seems to be a promising solution for Lebanon and the region
- The system is already accepted by many farmers in Lebanon
- Economical compared to conventional system ($250 less/ha)
- It brings the most the most economy by maximal protection of resources
- Needs more research and promotion: mainly on farmers land
- Needs more machinery: most limiting at this stage
- Needs great efforts by all partners and stakeholders
- Needs governmental support and new agricultural policies.

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