



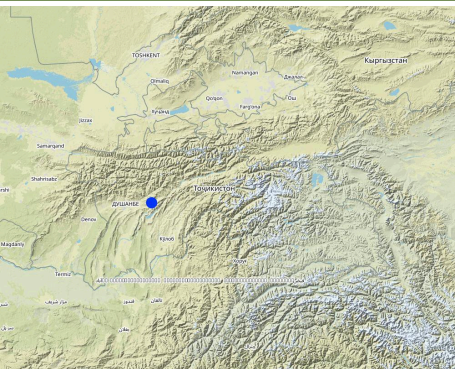
Intercropping of wheat in an existing apricot orchard (Erik Bühlmann (Berne, Switzerland))

Orchard-based Agroforestry (intercropping) ( )

Intercropping of wheat in an existing orchard that was established during the Soviet period.

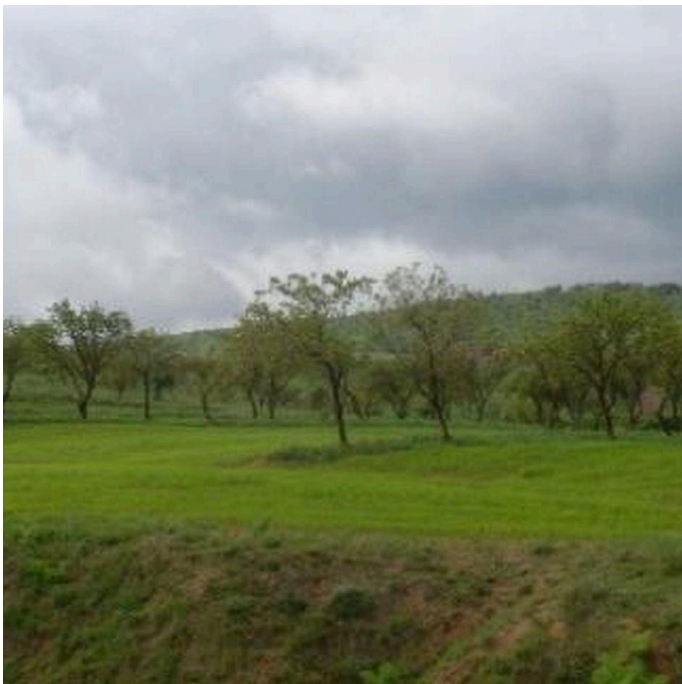
The technology involves intercropping wheat in an existing apricot orchard, that was established during soviet times to increase farm production, by integrating different resources in an environment protected from soil erosion. The intercropped area is ploughed by tractor. In general, farmers do not practice crop rotation since they usually allocate cereal production to the most fertile field plots of their farm. Along the trees aligned on contour, a three metre wide grass strip is left uncultivated to control runoff, and to protect the ground from splash erosion. Spacing between rows is 13 metres, which allows unhindered farm operations. Most orchards in Faizabad Rayon were established during Soviet times. Tree rows were planted close together in order to obtain maximum yields from the orchard monoculture systems. Some of the tree rows were removed, allowing more space for intercropping.

Purpose of the Technology: The technology is applied in existing orchards which generally range between 10-25% in gradient. In existing orchards, intercropping alone is relatively cost intensive. Harvesting two crops at a time increases overall farm production and improves food security since harvests of intercropped food crops are found to be more reliable than those on exposed annual cropland. However, many orchards are still owned by state farms which usually do not practice intercropping. Since management of fruit trees require considerable labour and material inputs (e.g. chemicals for pest/disease control as well as fertilisers) which often cannot be met by farmers, yields of fruit trees have declined after the privatisation of these areas. Furthermore, farmers often lack knowledge of appropriate orchard management techniques and miss opportunities to gradually replace old trees by new seedlings.



: Faizabad Rayon, Tajikistan,

		:
• 69.4107, 38.5886		
2)	:	(approx. 1-10
		?:
		:
		(> 50 )
		/



Overview of SWC field (Erik Bühlmann (Berne, Switzerland))



Intercropping of wheat in an existing apricot orchard (Erik Bühlmann (Berne, Switzerland))



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/

/



- : - , - ( ), - , - - alfalfa, esparzet ( )
- fruits ( , apricot, ? / plum ) , stone



/



, Wg: - Wt:



) - Cn: (

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- A1: / , A7:



- V5:



- M1:



Intercropping of wheat between apricot trees aligned on contour

Location: Chinoro, Faizabad Rayon, RRS

Technical knowledge required for field staff / advisors: moderate

Technical knowledge required for land users: moderate

Main technical functions: control of dispersed runoff: impede / retard, control of concentrated runoff: impede / retard, reduction of slope length

Secondary technical functions: increase in nutrient availability (supply, recycling,...), increase of infiltration, increase / maintain water stored in soil, reduction in wind speed, increase in soil fertility

Mixed cropping / intercropping

Material/ species: winter wheat

Quantity/ density: 150kg/ha

Remarks: intercropping between tree rows

Mineral (inorganic) fertilizers

Material/ species: superphosphate, silitra

Quantity/ density: 200kg

Remarks: only for intercropped wheat

Contour tillage

Remarks: between tree rows

Aligned: -contour

Vegetative material: F : fruit trees / shrubs

Number of plants per (ha): 200

Vertical interval between rows / strips / blocks (m): 2

Spacing between rows / strips / blocks (m): 13

Vertical interval within rows / strips / blocks (m): 4

Vegetative measure: aligned: contour

Vegetative material: G : grass

Vertical interval between rows / strips / blocks (m): 2

Spacing between rows / strips / blocks (m): 10

Width within rows / strips / blocks (m): 3

Vegetative measure: Vegetative material: G : grass

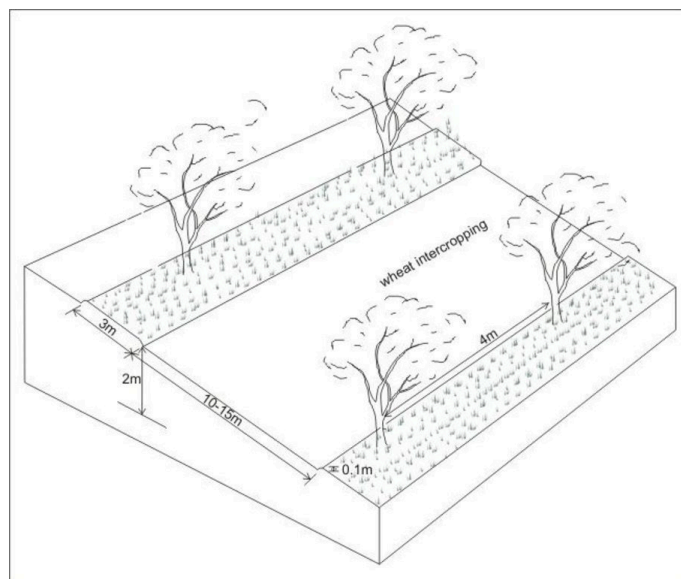
Vegetative measure: Vegetative material: G : grass

Vegetative measure: Vegetative material: G : grass

Fruit trees / shrubs species: apricot trees

Slope (which determines the spacing indicated above): 18.00%

Gradient along the rows / strips: 0.00%



Author: Erik Bühlmann, Berne, Switzerland

- ( ) 1 USD = 3.00
- 
- 
- 

The number of trees influences costs considerably, since orchard management is labour and input intensive

1. establishment of apricot orchard by state enterprise ( / : established in 1989)

2. acquiring land use rights for existing orchard lands from local authorities ( / : None)

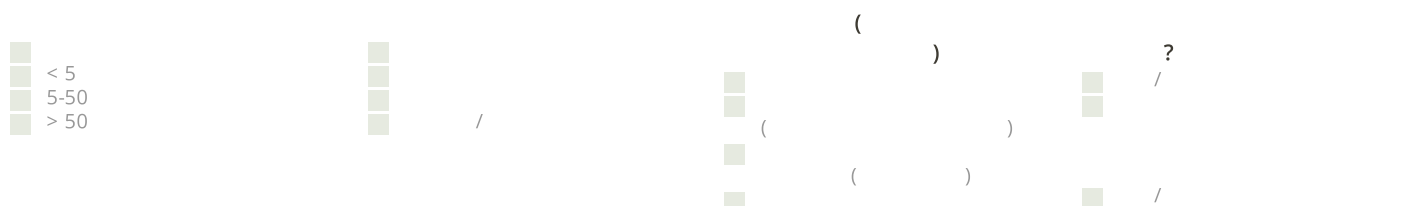
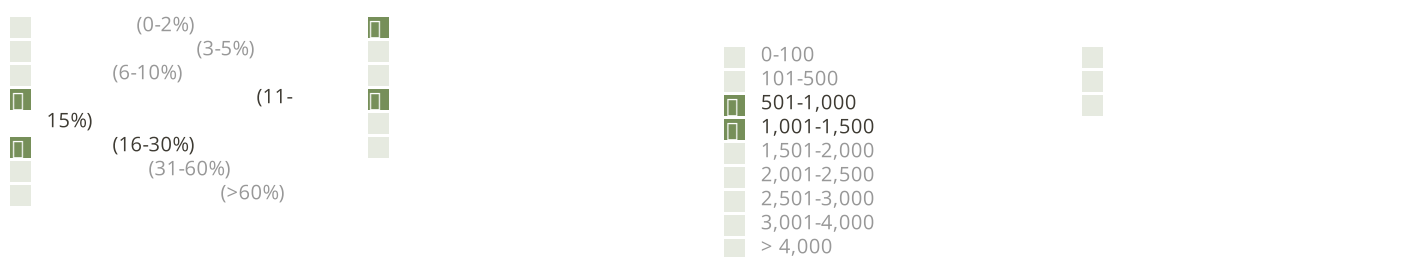
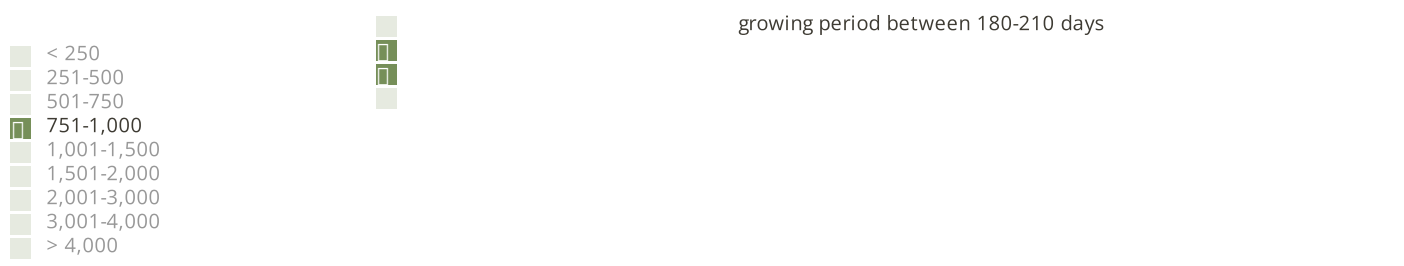
3. thinning and clearing of tree rows ( / : None)

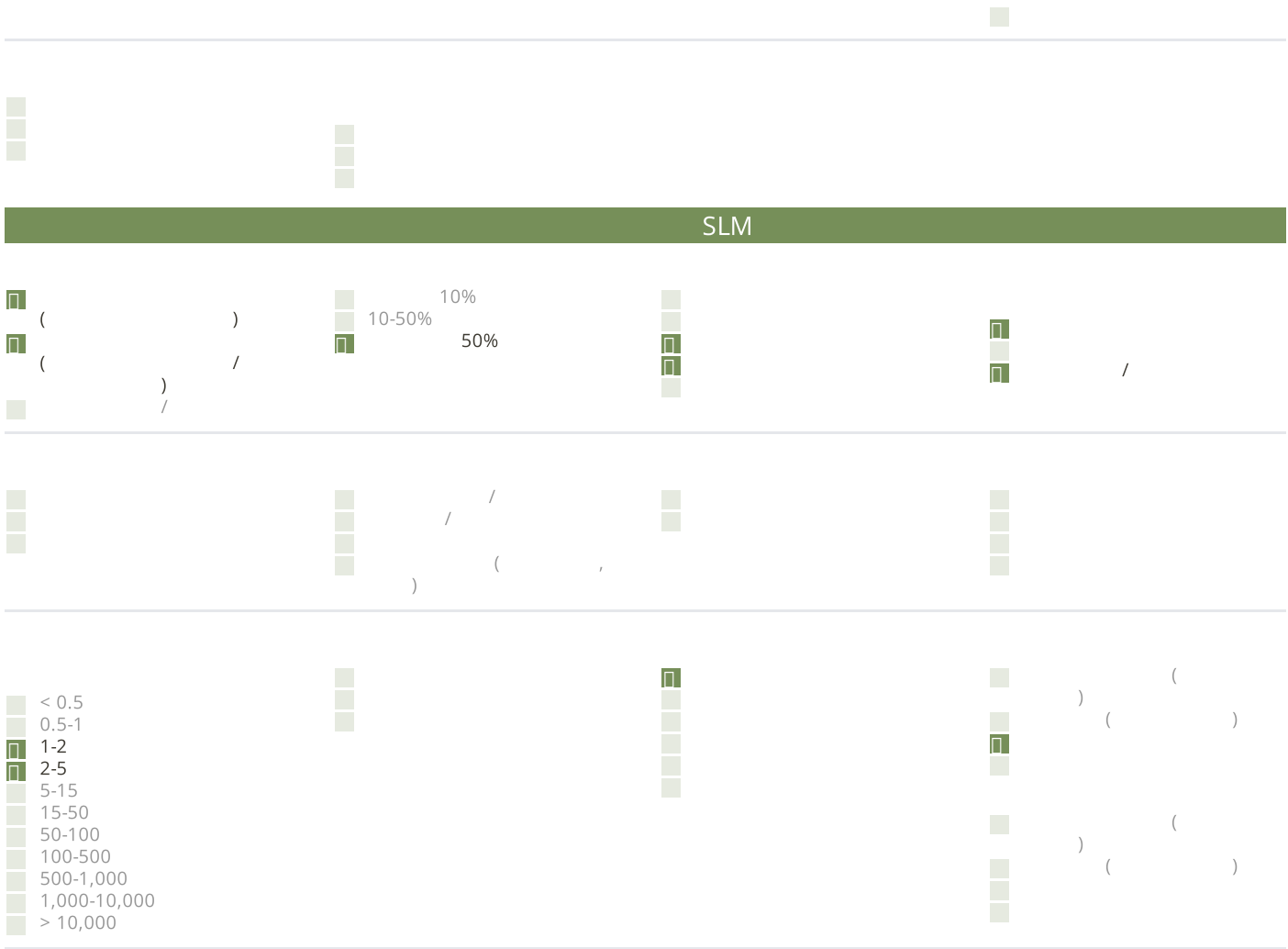
					%
			( )	( )	
thinning and clearing of tree rows	ha	1,0	6,0	6,0	100,0

tools	ha	1,0	25,0	25,0	100,0
				31.0	
				31.0	

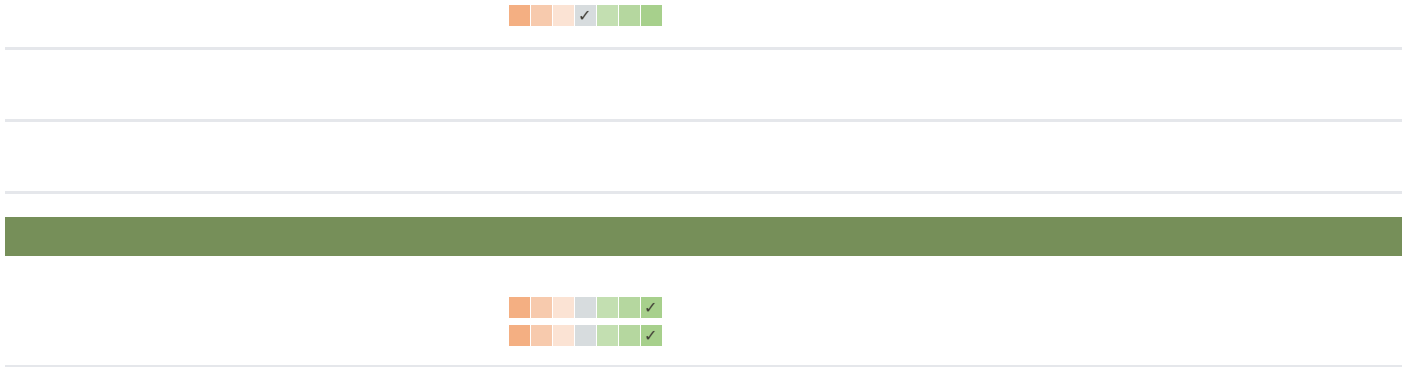
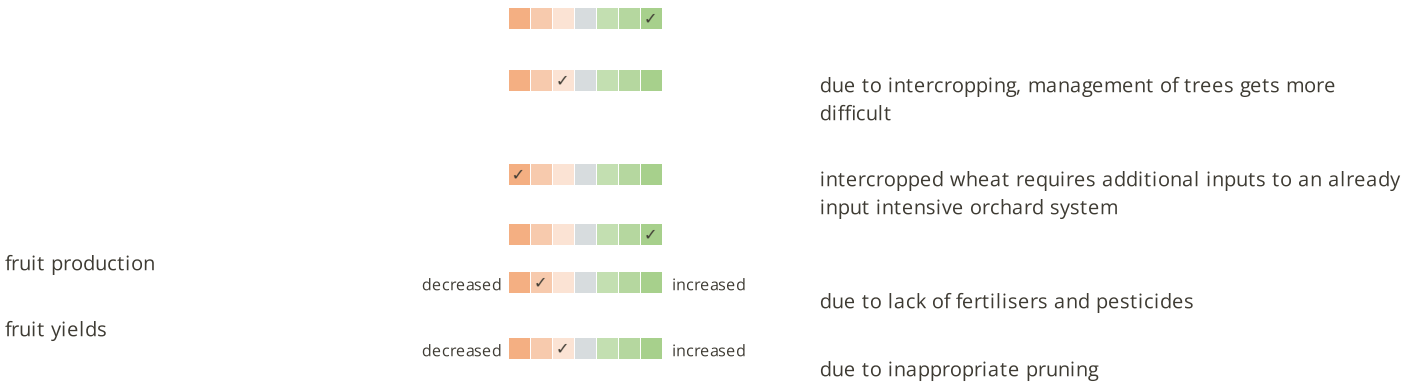
1. disc ploughing (area for intercropping) ( / : before sowing / annual)
2. sowing (winter wheat) ( / : None)
3. applying of fertiliser ( / : early spring / each cropping season)
4. harvesting ( / : summer / each cropping season)
5. pruning of fruit trees ( / : autumn/winter /annual)
6. cutting of grass strip ( / : summer /annual)
7. applying manure for fruit trees ( / : winter/early spring /annual)
8. removal of twiggs affected by insects/deseases ( / : spring /weekly)

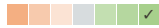
			( )	( )	%
sowing and weeding	ha	1,0	18,0	18,0	100,0
pruning of fruit trees	ha	1,0	45,0	45,0	100,0
cutting of twiggs affe	ha	1,0	15,0	15,0	100,0
machine use	ha	1,0	20,0	20,0	100,0
seeds	ha	1,0	30,0	30,0	100,0
fertilizer	ha	1,0	50,0	50,0	100,0
compost/manure	ha	1,0	40,0	40,0	100,0
				218.0	
				218.0	





Orchard-based Agroforestry (intercropping)





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- 1-10%
- 11-50%
- > 50%

- 0-10%
- 11-50%
- 51-90%
- 91-100%

NA

- / ?
- ?
- / ?
- ( )



- :
  - two harvests at a time
  - How can they be sustained / enhanced? increase in farm production
  - good wheat harvests in intercropping systems
  - :
  - low costs for establishment (intercropping only)
  - wheat production with very little soil erosion
  - intercropping can improve food security of low income families

- / / :
- yield of fruit trees insufficient because required inputs are not affordable gradually replace old trees by new seedlings
- Insufficient yields of intercropped plants because of shadow of old/large fruit trees
- orchard systems vulnerable to pests, late frost and strong winds
- / / :
- productive orchard systems require considerable amounts of recurrent inputs (e.g. chemicals for pest/disease control, fertiliser) which locals often cannot afford avoiding intercropping of sparsely growing crops in vulnerable intercropping systems; improving ground cover by mulching
- in comparison to orchards with an intact grass cover, intercropping of sparsely growing plant species increases the risk of soil erosion
- intercropped wheat hinders maintenance activities of fruit trees



#### Editors

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2011

: 2

2021

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[https://qcat.wocat.net/km/wocat/technologies/view/technologies\\_1002/](https://qcat.wocat.net/km/wocat/technologies/view/technologies_1002/)

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- CDE Centre for Development and Environment (CDE Centre for Development and Environment) -
- NCCR North-South (NCCR North-South) -
- Pilot Program for Climate Resilience, Tajikistan (WB / PPCR)

