

Agroecological measures

The programme "Management of natural resources and safeguarding of ecosystem services for sustainable rural development in the South Caucasus" (ECOserve) aims to support the achievement of the Strategic Roadmap on production and processing of agricultural products in the Republic of Azerbaijan, focusing on target 7, which aims to protect the environment, foster sustainable use of natural resources and build enhanced climate resilience in agriculture. Environmentally friendly measures, which aim to balance the economic, social and environmental value of natural resources are essential for a sustainable development in Azerbaijan's agriculture.

The objective of the pilot project of ECOserve is to introduce environmental-friendly and sustainable practices of natural resource management in the agricultural sector of Azerbaijan. Activities of the pilot project focus on Good Agriculture Practice (GAP) (such as minimum tillage, optimized seeds and fertilizer application based on soil activities, hedgerows establishment and planting of flower stripes), that is implemented, tests and evaluates jointly with several stakeholders (RAEIM, DAIM, local farmers) in the ECOserve pilot site in Kurdamir.

Hedgerow

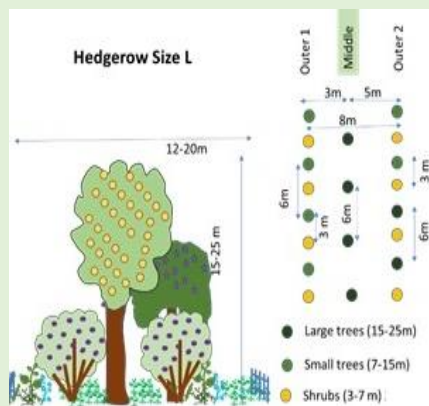
Planting hedgerows contributes to the increase of biodiversity in agriculture landscape, reduces evaporation and wind erosion. Based on this experience and observations in Kurdamir district different designs of hedgerows were discussed. The difference was related to the width of the plantation and the selection of the plants, respectively the main target of the windbreak apart from reducing wind speed.

The size "L" hedgerow is a 20-meter-wide plantation of trees and shrubs, which can partly be used for the production of fruits. It could be considered an agroforestry plantation. Due to the adult size of the trees selected for this hedgerow the distance between the trees is much bigger than the other plantations.

The following aspects were considered for the plantation of the hedgerow.

- Irrigation for the first 3-5 years needs to be guaranteed.
- Fencing need to be established to protect the plantation from animals/wildlife browsing.
- Specific protection measures for the single plants need considered.
- Trees and shrubs should be adopted to the local climate conditions and soil properties.
- Drought and salt tolerant plants should be considered prior.

Risks and Risk mitigation The costs of this kind of plantations are high. Without incentives and/or subsidies it is not realistic to be implemented on private farms. The land ownership of small farmers with fragmented agriculture land is a strongly hindering factor for upscaling of similar activities. The ownership and maintenance of the plantation needs to be secured for at least five years. The use of the plantation by animals must be prohibited in the first 5-7 years. Lobbying for the development of a subsidy scheme or the provision of incentives by state authorities for plantations on private agriculture land could be solution to support establishing the hedgerows.



"L" size hedgerow ©Thomas Wehinger 2021



Newly planted hedgerow in ECOserve pilot site © Samir Abbasov, GIZ

Table: The list of trees and bushes planted in ECOserve pilot site

Latin Name	Name AZ	Name ENG
<i>Pinus eldarica</i>	Eldar sami	Mondell pine
<i>Platanus orientalis</i>	Şərq çınarı	Oriental plane
<i>Morus alba</i>	Tut	White mulberry
<i>Olea europaea</i>	Zeytun	European olive
<i>Ficus carica</i>	Əncir	Common fig
<i>Malus orientalis</i>	Alma	Kaukasus apple
<i>Pistacia atlantica</i>	Kütyarpaq püştə	Wild pistachio
<i>Prunus armeniaca</i>	Ərik	Apricote
<i>Punica granatum</i>	Nar	Pomme grenade
<i>Prunus amygdalus</i>	Badam	Sweet almond tree
<i>Caesalpinia</i>	Sezalipniya	Poinciana/ paradise
<i>Elaeagnus angustifolia</i>	Zeytun	Wild olive

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Flower stripes

The plantation of flower stripes for the purpose of the conservation of biodiversity and the support of pollinators is widely known. Flower stripes as well as hedgerows have beneficial effects on pest management and pollination services for agriculture crops and plantations (due to more diversification; establishment of perennial extensive margins and flowering strips at the edge of fields to create habitat for birds and other wildlife; predator pray approach). Similar to the push and pull technology flower stripes attract insects and pests, which otherwise would attack crops. The effects depend a lot on the specific mix of seeds used for the flower stripes and the hedgerows. For the pilot site of ECOserve project was selected the most suitable mix of seeds to be sown along or within agriculture fields.

Time for seeding

Seeding depends, if the seed mix is suitable for a one-year or for more than one year. Flower stripes with perennial species can be established at any time suitable for seeding from March until October. One year flower stripes need to be established as early as possible - from March until June, but as early as possible to catch as much rain and soil moisture. Seeding in June after winter grain crops such as wheat, barley or rye most likely will need irrigation for successful germination, unless rain is sufficient. Seeding cold season after e.g. cotton, beans, corn may need irrigation after sowing - intercropping may need to be considered. The soil temperature should be above 10 °C.

Crop maintenance

- Flower strips crops should be left growing for as long as possible

Irrigation

- Flower stripes may need irrigation like any other crops
- Only if the seed mix is containing mainly drought resistant species, irrigation may not be needed

Guidelines for the implementation of flower stripes

Selection of area for flower stripes

Flower stripes can be established on any agriculture plot. If the plots are very big (e.g. 30 ha) it is recommended to plant several flower stripes, accounting for up to 5% of the total area. In order to reduce economic losses, farmers establish flower stripes along roads and paths, along channels and water or on marginal land, which can not be used for productive crops.

Seedbed preparation

- Fine, crumbled seedbed
- Free from plant residues
- If necessary, plough the field before
- Avoid competition from other plants in the first growth phase
- Control of problematic weeds

Seeding

- Surfaces must be dry
- Depth of seed according to needs - but usually not very deep.
- If big seeds and extremely small seeds are used for flower stripes, it may be necessary to do the seeding in two steps - first bigger seeds, which need more depth - than shallow seeding with
- In case of seed mixes it is advised to use two different machines or work processes.



Flower stripes in the field of farmer in Kurdamir ©Abbas Ismayilov



Flower stripes in Denmark, © Stephan Kroel, GIZ

Reference

The poster was developed based on "Farm Management Plan of ECOserve pilot sites" elaborated by Thomas Wehinger, Samir Abbasov and Nizami Ibrahimli