



Report on Cereals

Demo farm location

Village Arkhiloskalo is located in one of the low humidity regions in Georgia. It is located in the Kakheti region and the main culture produced the last 30 years is winter barley and winter wheat. Before when there was an irrigation in the village people used to have a wine yards. In this area, farmers do not practice crop rotation system which caused soil problems, mainly soil exhaustion. After Soviet Union was collapsed, almost all of the windbreaks were chopped down to be used as woods and as a result it caused soil erosion.

According to climate-data.org (<https://en.climate-data.org/asia/georgia/kakheti/arkhiloskalo-321904/>) Arkhiloskalo is located at 671 m above the sea level and the driest month is the January. (28 mm of precipitation) and in the June, the precipitation reaches its peak, with an average of 106 mm.

General information

Based on climatic conditions of demo plot, FinExCoop's main mission was to introduce crop rotation system, which will be better for yield and mainly for increasing soil productivity.

At the beginning of the FinExCoop project (September 2019), different varieties of grain crops produced by Florimond-Desprez (one of the leading seed producer in Europe) were imported from France and later sown in the village of Arkhiloskalo, Dedoplistskaro Municipality, Kakheti Region.

Winter wheat, winter barley, durum wheat, winter peas and winter triticale were sown in the demonstration plot of pilot farmer Niko Beniaidze.

The above-mentioned cereal and legume crops were selected based on following:

- ✓ The knowledge of the local farmers, mainly farmers in the region grow wheat and barley
- ✓ A new varieties triticale and durum were chose because of market demand and high productivity
- ✓ Legume for better crop rotation and improving food base in cattle feeding.
- ✓ Above mentioned crops were selected according to climatic conditions

Demo day

At the beginning of the project we have created a demo plot with one of our pilots in Arkhiloskalo, Kakheti region. The project bought from France different types of cereals and legume to improve crop rotation system and feed ratio for animals.

In July 2nd FinExCoop had a harvest of its demo plots with Shiraki+. The harvest was attended by farmers, international and local partners and input suppliers. Demo plot covered three hectares of land. Even though the drought was a serious issue in Kakheti that year and affected most if not all the farmers FinExCoop still had a successful harvest.



The demo plot has given example to other farmers and input suppliers of different ways and different crops they could use to farther develop of crop rotation system to increase yield and improve feed ratio of their cattle to increase their milk yield.

Soil preparation / Soil Fertilization / Weed control

For soil preparation demo famer used heavy disc right after the harvest to reduce evaporation of moisture and raise soil absorbency. After that farmer used cultivator against weed in September.

The farmer didn't use insecticide to spray the seeds because it was already sprayed, by supplier. During the seeding, the demo framer used 300-kg of P:K 52:12 per ha.

In wintertime, there was a cold-weather so during hatching wheat was little frozen it had an impact on yields. Also we experienced cold weather and drought in the spring therefore, wheat had a water problem which had a massive impact on grain size.



On October 27th farmer with FinExCoop's team sowed wheat, triticale and barley. On this day also demo plot was rammed. Then on March third the farmer used nitrogen 68 kg per ha to have better yield. On April 17th the farmer used two types of herbicides, first one was against Avena Fatua and the second one was against other weeds. During the April farmer used fungicide against the Stem Rust. The first of July wheat was harvested by new "Pales" combine and was stored in the storage.

Technical assistance

Because of the COVID-19 pandemic, borders were closed, and it was very challenging to bring international experts to Georgia. The program adapted to the specific situation and

connected farmer to international expert through local experts. When necessary, an online connection with the international expert was directly accepted from the demonstration plot.

Before the borders closed due to COVID-19, FinExCoop managed to bring in an international conservation agriculture expert to introduce to the farmer benefits of using zero-till equipment. Those benefits are reduction of evaporation from the soil due to low precipitation in the region. The farmer expressed great interest in this modern technology. Organized by FinExCoop and supported by UNFAO, later in the spring farmer sown his own barley and oats. Which showed good results for barley, despite the deplorable weather. The farmer and the FinExCoop team are planning to collaborate using this technology.






At the beginning of the year, also, FinExCoop brought an international expert to Georgia. For better understanding of profitability of the different crops, the expert and the local team introduced to the farmer Gross Margin calculator and trained him to learn how to use it.



Results:



Tri al No	Product	Yield (kg/ha)	Yield Condit ion	Nu mbe r of Grai ns	Lengt h of Wheat ear (cm)	Comment	
	Winter wheat						



1	Winner	1869	Poor	43	10.2	<p>July 1, 2020 were harvested, yield was 1.869 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 90% of the grains were germinated. In 2019 sum of sown area for each variety was 0.30 ha. On Average wheatear was 10.2 sq. Number of gain in one wheatear 43. Rootage was very good.</p>	
2	Providence	1816.5	Poor	42	7.5	<p>July 1, 2020 were harvested, yield was 1.817 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 90% of the grains were germinated. In 2019 sum of sown area for each variety was 0.30 ha. On Average wheatear was 7.5 sm. Number of gain in one wheatear 42.</p>	


						Rootage was very good.	
3	Frenetic	2060.1	Poor	49	7	<p>July 1, 2020 were harvested, yield was 2.060 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 90% of the grains were germinated. In 2019 sum of sown area for each variety was 0.30 ha. On Average wheatear was 7 sq. Number of gain in one wheatear 49. Rootage was good.</p>	
4	Euclide	2358.3	Average	49	7	<p>July 1, 2020 were harvested, yield was 2.358 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 93% of the grains were germinated. In 2019 sum of sown area</p>	

						<p>for each variety was 0.30 ha. On Average wheatear was 7 sq. Number of gain in one wheatear 49.</p>	
5	Complice	1845.8	Poor	48	7.3	<p>July 1, 2020 were harvested, yield was 1.864 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 99% of the grains were germinated. In 2019 sum of sown area for each variety was 0.30 ha. On Average wheatear was 7.3 sq. Number of gain in one wheatear 48. Rootage was very good.</p>	

6	Filon	2007.5	Poor	50	7	<p>July 1, 2020 were harvested, yield was 2.008 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 90% of the grains were germinated. In 2019 sum of sown area for each variety was 0.30 ha. On Average wheatear was 7 sq. Number of gain <u>in one wheatear 50.</u> <u>Rootage was very good.</u></p>	
Winter barley seeds							
7	Multie	2794.8	avarage	n.a	n,a	<p>July 1, 2020 were harvested, yield was 2.795 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 96% of the grains were germinated. In 2019 sum of sown area for each variety was 0.30 ha.</p>	

8	Campagne	2205.1	avarage	n.a	n.a	<p>July 1, 2020 were harvested, yield was 2.205 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 98% of the grains were germinated. In 2019 sum of sowned area for each variety was 0.30 ha. 48. Rootage was very good</p>	
Durum wheat seeds							
9	Casteldoux	2643.6	avarage	7	32	<p>July 1, 2020 were harvested, yield was 2.644 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 97% of the grains were germinated. In 2019 sum of sowned area for each variety was 0.30 ha. On Average wheatear was 7 sq. Number of gain in one wheatear 32.</p>	

10	Toscadou	1221.6	poor	7	29	<p>July 1, 2020 were harvested, yield was 1.222 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 99% of the grains were germinated. In 2019 sum of sown area for each variety was 0.30 ha. On Average wheatear was 7 sq. Number of gain in one wheatear 29. Rootage was poor.</p>	
Triticale seeds							
12	Brehat	2,025	poor	7.3	48	<p>July 1, 2020 were harvested, yield was 1.864 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 99% of the grains were germinated. In 2019 sum of sown area for each variety was 0.30 ha. On Average wheatear was 7.3 sq. Number</p>	

						of gain in one wheatear 48	
13	Vivier	2,072	poor	7.3	42	<p>July 1, 2020 were harvested, yield was 1.864 kg/ha. Yield was poor for this region because of spring frost and drought summer. Because of this the grain could not complete vegetation. Grains were too small and undersized. Per germination test 99% of the grains were germinated. In 2019 sum of sown area for each variety was 0.30 ha. On Average wheatear was 7.3 sq. Number of gain in one wheatear 42</p>	

Analysis

FinExCoop team made a germination test which showed that most of the varieties did not germinate well, therefore we cannot use them as a seeds for the next year. Germination problem

was caused by weather. (In winter there was low frost and the spring was draught so it caused small grains.) As a result, we recommended farmer those seed which had good germination and it is recommended to use them as seeds. Table below shows results of germination tests for seeds provided by Florimond-Desprez.

Trial No	Product	Number of ha	Number of Seeds	Germination	Fail in plant	Germination rate
	Winter wheat seeds					
1	Winner	0.30	100.00	90.00	10.00	90.00
2	Providence	0.30	100.00	80.00	20.00	80.00
3	Frenetic	0.30	100.00	90.00	10.00	90.00
4	Euclide	0.30	100.00	94.00	6.00	94.00
5	Complice	0.30	100.00	100.00	0.00	100.00
6	Filon	0.30	100.00	87.00	13.00	87.00
	Winter barley seeds					
7	Multie	0.30	100.00	96.00	4.00	96.00
8	Campagne	0.30	100.00	98.00	2.00	98.00
	Durum wheat seeds					
9	Casteldoux	0.30	100.00	97.00	3.00	97.00
10	Toscadou	0.30	100.00	99.00	1.00	99.00
	Triticale seeds					
12	Brehat	0.30	100.00	86.00	14.00	86.00
13	Vivier	0.30	100.00	95.00	5.00	95.00

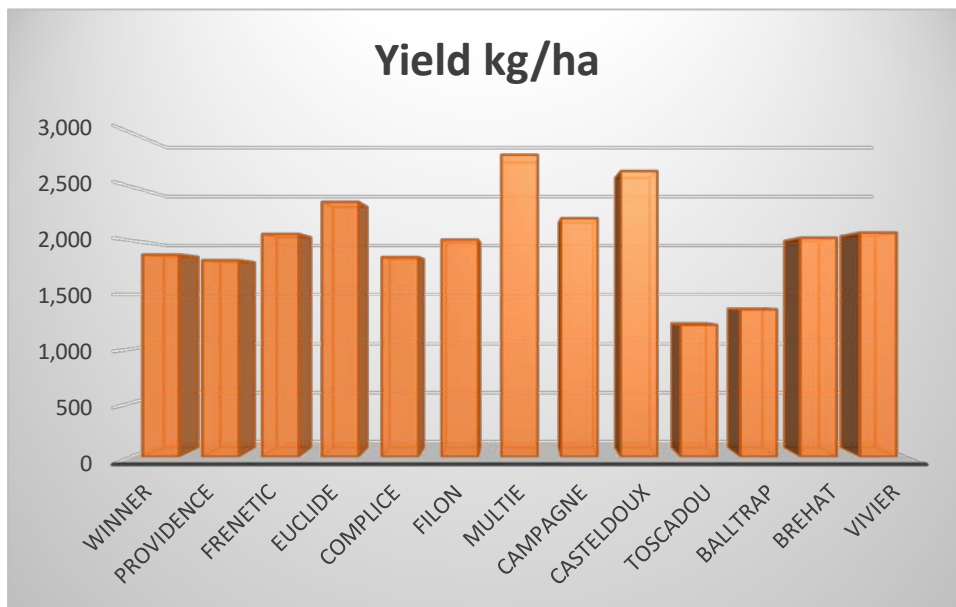
Gross Margin calculator

After the harvest, a calculation of Gross Margin was made in terms of each variety, which showed their profitability. Gross Margin Calculator enables the farmer to see the financial aspects of his business, analyze the costs incurred and make adequate decisions for the future. Table below shows total income, total cost and net income by variety, also Economic Productivity (Earned GEL per spent GEL).

Trial No	Product	Total Income (GEL)	Total Cost (GEL)	Net Income (GEL)	Economic Productivity (Earned GEL per spent GEL)
Winter wheat seeds					
1	Winner	1307.95	597.70	710.25	2.19
2	Providence	1271.55	597.70	673.85	2.13
3	Frenetic	1442.12	597.70	844.42	2.41
4	Euclide	1650.83	597.70	1053.13	2.76
5	Complice	1292.08	597.70	694.38	2.16
6	Filon	1405.25	597.70	807.55	2.35
Winter barley seeds					
7	Multie	2096.12	597.70	1498.42	3.51
8	Campagne	1653.88	597.70	1056.18	2.77
Durum wheat seeds					
9	Casteldoux	1850.57	597.70	1252.87	3.10
10	Toscadou	855.17	597.70	257.47	1.43
Triticale seeds					
12	Brehat	1417.50	597.70	819.80	2.37
13	Vivier	1450.28	597.70	852.58	2.40

Chart below shows yield per ha by varieties.

Variety	Yield kg/ha
Winner	1,869
Providence	1,817
Frenetic	2,060
Euclide	2,358
Complice	1,846
Filon	2,008
Multie	2,795
Campagne	2,205
Casteldoux	2,644
Toscadou	1,222
Balltrap	1,367
Brehat	2,025
Vivier	2,072



For 2020 FinExCoop did not have as successful yield as we hoped so. We are not able to compare our yield to other farmer's yields since it will only be published in 2021. We can also not compare our yield to 2019 average yields as in 2019 weather conditions were much better so it would not be a fair comparison. However with our knowledge and knowledge of local farmers average yield in Kakheti was around 1500-1600 KG per ha. According to graph shown above this number falls short compared to our yield, which only means still successful yield for FinExCoop.

Recommendations

In the village Arkhiloskhalo where the demo plot was located and generally in the Dedoplistskaro municipality one of the most critical issue is an irrigation. To minimize moisture evaporation from the soil, it is recommended to use agricultural technologies such as minimal tillage, zero tillage, Disheveling, and weeding. Also, it is recommended that for the next year FinExCoop should supply demonstration farms with flagship brand pesticides suggested by international and local experts. International and local experts should identify the proper time for applying chemicals and attend the spraying process to be sure that pesticides are used correctly.

Based on last year experience, results and availability of seeds from the international partner companies, FinExCoop international and local experts chose two wheat varieties Filon and Frenetic, one barley Campagne and two varieties of triticale Brehat and Viver. Regarding durum wheat there was a problem with marketing, because in Georgia there is very small market for durum wheat (only several companies are processing durum wheat) and price was the same as for winter wheat. Therefore, farmers are not interested. So, before we offer farmers to plant durum, it is

necessary to do a detailed market research, identify demand of durum wheat in Georgia and find potential customers.

Despite the fact that triticale is a relatively new variety in Georgia, farmers show a big interested in it. The reasons for this is high yield and possibility to produce large amount of green mass. Therefore, we are going to support and work with those farmers who want to produce it.