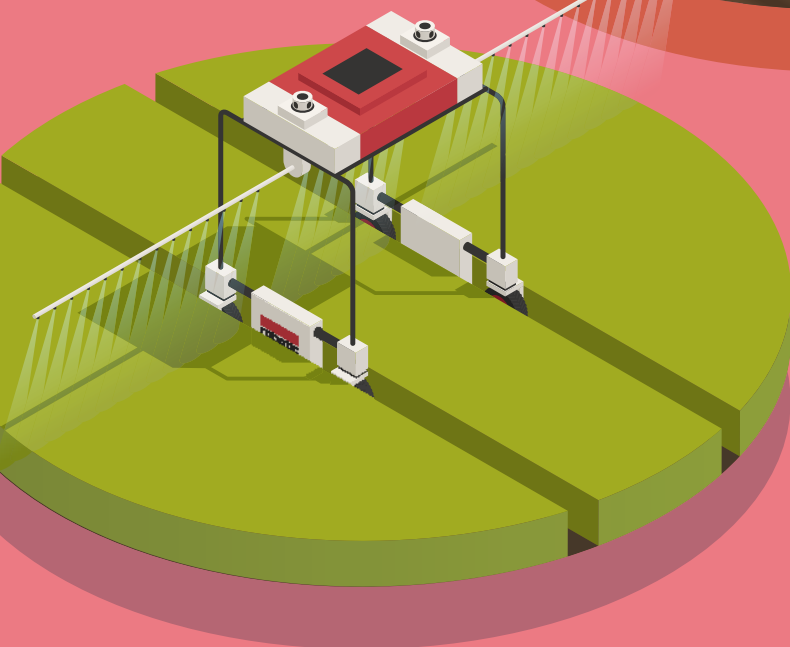


AgroTech 2022

Industry overview



AgroTech 2022

Industry overview

This report examines the worldwide economic and behavioral trends in agricultural production and changes in agrarian supply chains, as well as giving an overview of Europe's promising technological start-ups. The authors assume that worldwide demand and consumption of foodstuffs are going to increase, while the need to optimize production of foodstuffs is going to increase due to climate change and military conflicts. The most successful companies in the agrotechnology market were identified in the spheres of new food products (most often meat substitutes) and analytical and monitoring tools, as well as in environmentally clean production.



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Introduction

Understood by the term “agrotechnologies” in the report are technological solutions that are used in crop farming, livestock farming, and aquaculture with the aim of increasing yields, efficiency, and profitability.

The following sectors fall under our focus:

- Alternative sources of raw materials and food (for example, obtaining protein from insects);
- Agricultural pest control;
- Use of drones for agricultural purposes;
- Obtaining and using satellite data;
- Use of sensors and “smart” devices in agriculture;
- Monitoring the stages of maturity of plants and animals/fish;
- Forecasting of weather conditions;
- Automatization of plant irrigation;
- Regulating the lighting and temperature in which plants or animals/fish are found;
- Analytical tools for monitoring soil condition and the condition of plants or animals/fish;
- Biotechnologies for agricultural needs;
- Hydro- and aquaponics;
- Personalized nutrition;
- Organic farming;
- Indoor farming: robotics and the equipment for its implementation;
- Increasing the efficiency of supply chains for agricultural products and of marketplaces wfor agricultural equipment and products.



Overview

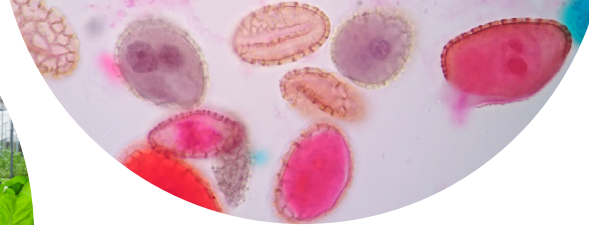
of international trends

Economic and behavioral trends

- 1** McKinsey is forecasting a 50% growth in worldwide demand for food products in the next 15-25 years and a 70% increase in the quantity of calories consumed by 2050. In the meantime, 25% of fertile land is already no longer suitable for growing agricultural products and is in need of restoration.
- 2** The quantity of people who are going hungry because of climate change, pandemic, and military conflicts is growing. The Global Network Against Food Crises has estimated that by the end of 2021, 142 million people in the world were experiencing a shortage of food.
- 3** McKinsey estimates that by 2030, 40% of the demand for fresh water is not going to be satisfied. Solutions for the desalination, reclamation, and transportation of water, as well as for the reduction of losses in water supply systems, are going to be in greater demand because of this.
- 4** Protein consumption in developing countries is increasing. A major driver in this sphere remains China, which has accounted for around 50% of the increase in demand for meat in recent years. McKinsey's experts are forecasting that the growth in demand will slow, while interest in "laboratory" meat and protein products based on plant and insect raw material will rise.
- 5** Developed countries are having to fight the problem of obesity among the population, which is stimulating the development of a market for healthy and functional foods. The trend toward healthy foods signifies that the use of sugar in food will decline. This, in its turn, will make ethanol, which is produced from sugar cane and sugar beets, more affordable and accessible, which will have a favorable impact on the biofuels market.

- 6 The geography of farming is going to change: new agricultural regions are going to appear because of climate change and a decline in the cost of energy. There is a noticeable trend toward the development of agriculture in East Asia and African countries south of the Sahara.
- 7 Continued growth in demand for wheat, corn, sugar, and soybeans is being forecast through 2027. These commodities are the top agricultural crops in terms of consumption, and they are going to retain their lead thanks to population growth and rising incomes in the Asian countries.
- 8 The UNO is doing work to reduce the quantity of food waste. According to data for the end of 2019, 931 million tons of food is sent for disposal every year in the world — this comes to 74 kg per person. The more economically developed a country, the higher this indicator is.
- 9 Trading margins for agricultural products have fallen significantly over the past 25 years: from an average of 15% in 1998 to 9% in 2018. This has led to an increase in demand for solutions that allow for optimization of farmers' and distributors' expenditures.

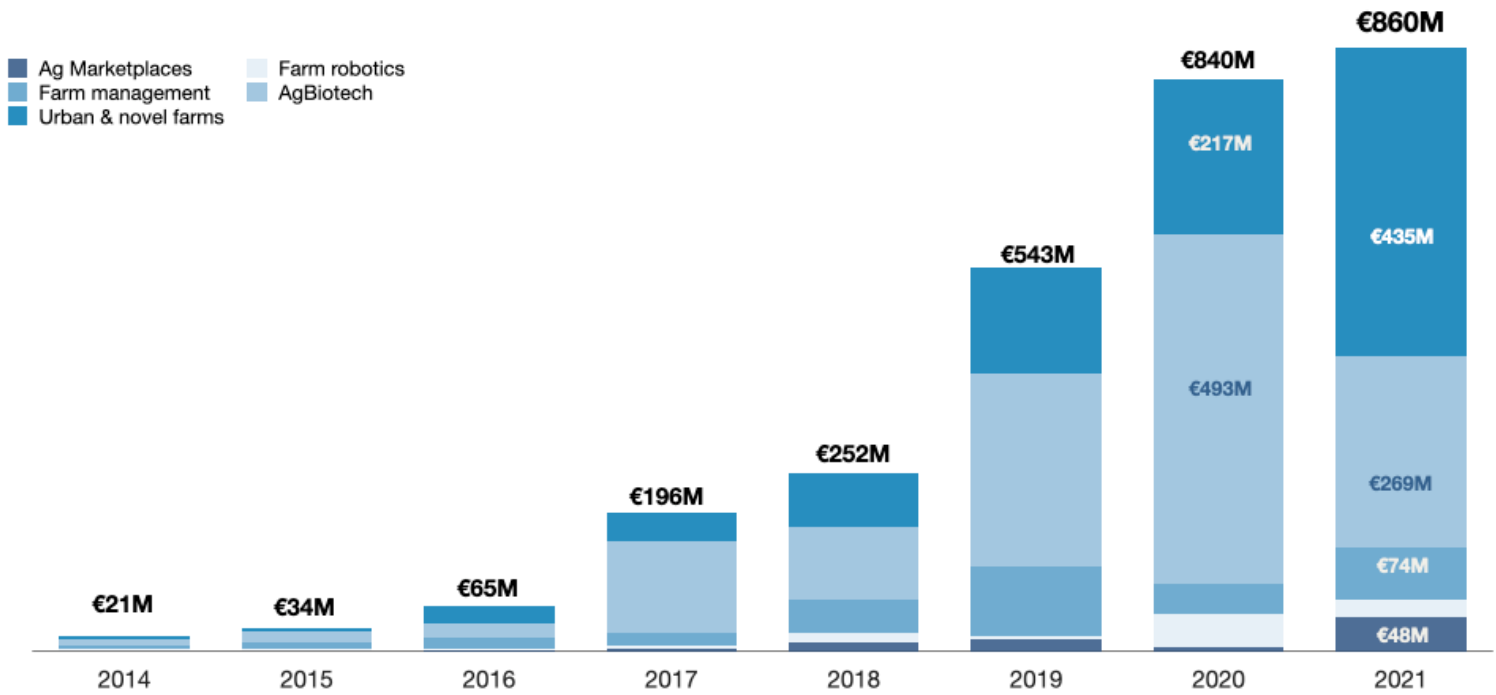




Technological trends

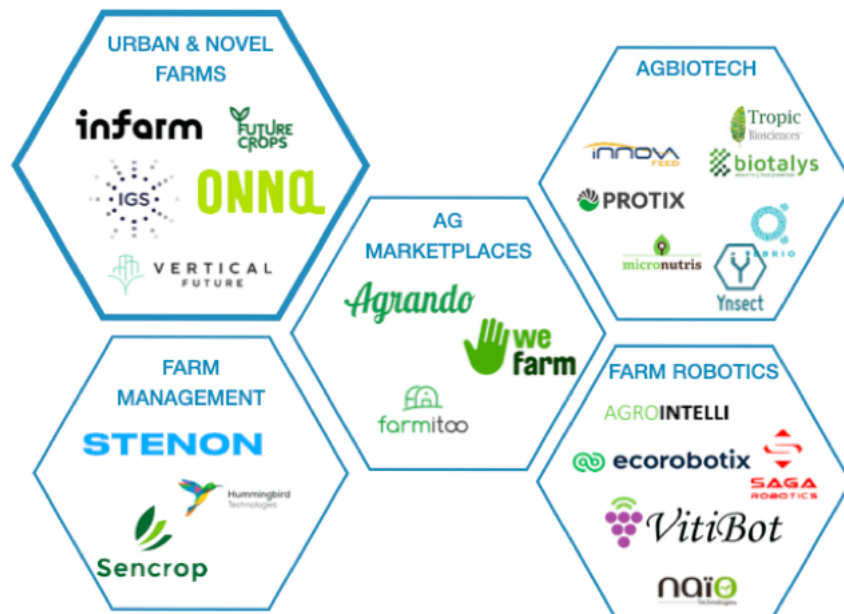
- 1** Demand in developed countries is growing for “precision agriculture” solutions — farming based on big data. What are needed are solutions that will aid in choosing the optimal agricultural crop in terms of cost/profit ratio, as well as allowing the volume of the harvest to be forecast. The quantity of projects that gather and analyze data on soil condition is growing. Big data are used too for working out infrastructure, since analyzing them helps in choosing the best location for a warehouse and in optimizing the work of agricultural machinery. Analytical solutions will likewise help save a greater part of the harvest: up to 30% of it is lost with some agricultural crops today due to the particular aspects of supply chains.
- 2** An important role in the development of the market is played by new plant breeding technologies. NPBTs include achievements in the field of genetics and molecular biology over the past 40 years. Precise methods for editing genes with the use of molecular mechanisms have been developed thanks to knowledge about the interaction of genes in plants, which has allowed the targeted “turning on”, “turning off”, and modification of genetic material in specific sections of the genome of agricultural crops—such tools as zinc-finger nuclease, transcription activator-like effector nucleases (TALEN), oligonucleotide-directed mutagenesis (ODM) and clustered regularly interspaced short palindromic repeats (CRISPR).
- 3** Start-ups that produce new food products by the method of replicating animal cells and obtaining protein from plant and entomological raw materials are gaining in popularity. This is associated with the exacerbation of problems with the environment, sustainable development, and public health.
- 4** Solutions are being developed in the sphere of “smart packaging” — solutions with the use of biotechnology and printed electronics. Such packaging allows products to be stored fresh for longer periods, their authenticity to be verified, and the beneficial properties of food to be retained during refrigerated storage.

Volume of investments in agrotech in Europe



Source: <https://www.digitalfoodlab.com/%F0%9F%9A%9C-%F0%9F%87%AA%F0%9F%87%BA-european-agtech-startups-leading-disruption-agriculture/>

The largest European start-ups by sector

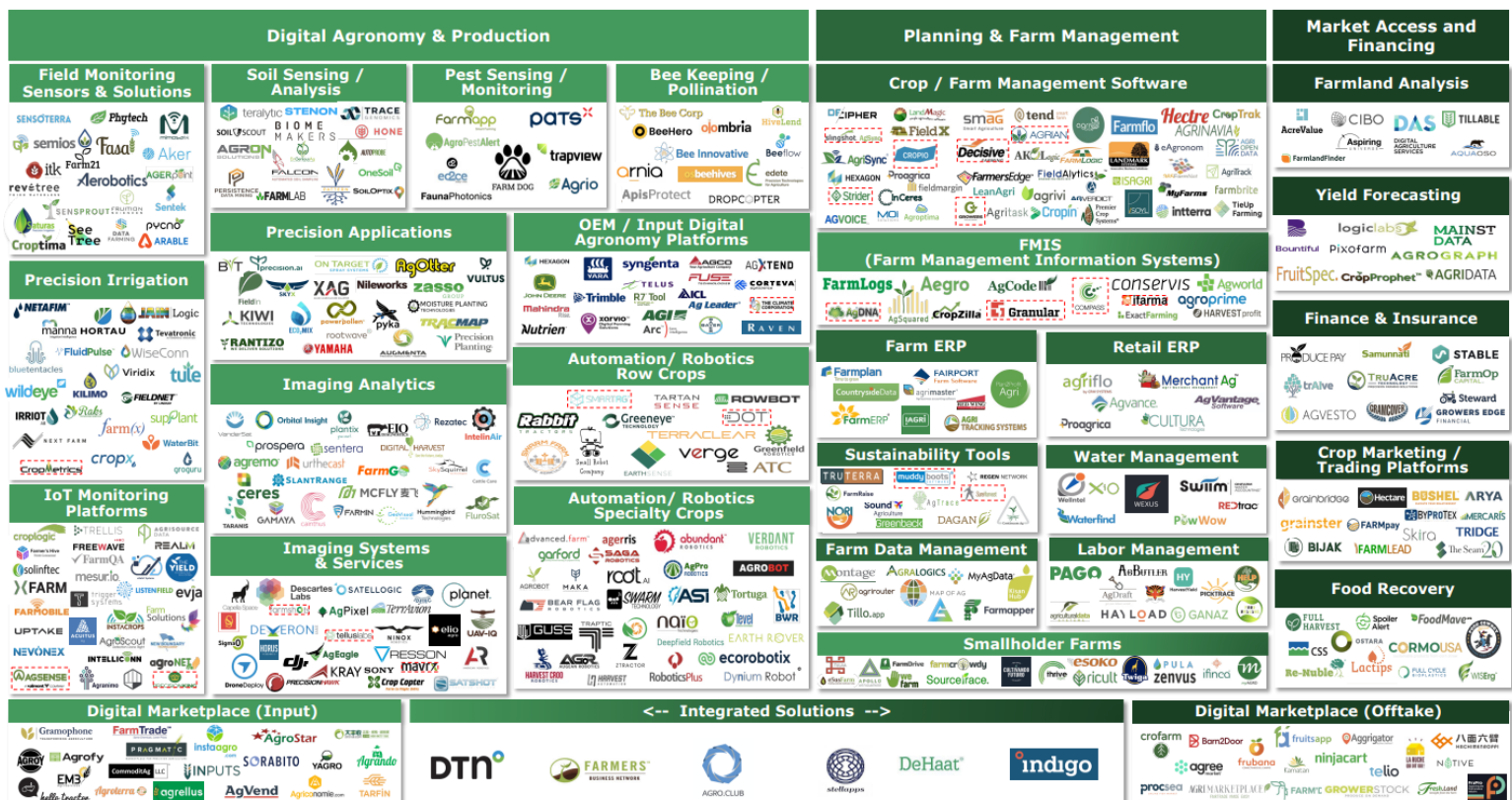




Sectors in the industry in which technological start-ups are developing

According to the data of the analytical company CB Insights, in 2020 start-ups in the sphere of agrotechnology raised \$6.2 billion in venture-capital financing through 460 investment transactions. There is no 2021 data for the whole world yet; however, experts note that just in the third quarter of 2021 alone, the volume of financing of start-ups in the sector grew by 82% compared to the situation a year earlier. In Europe for 2021, the volume of venture-capital transactions with start-ups in the food-tech area reached 9.5 billion euros.

The technological sectors in the market for technologies for traditional agriculture (farmtech) and vertical farming (indoor agtech):



Environmental Controls

BARTLETT AEM Greenspec
MICO-GROW ARGUS hoogendoorn
SERCOM Munters PhyFarm
WADSWORTH DAMATEX growlink
ANJOU Automation Link4
Hortaco Horti RIDDER Agricontrol
Autogrow

Irrigation & Fertigation

calcon supPlant RITEC
HUNNA nutriconrol
METAFIM H.E. Anderson KARACA
ENTONEX TECHNIK ELINE Total Grow Control

Lighting Systems

G2V heliospectra areon
VALOYA bios GE current
signify GrowFlux
LONDINUS LOUIS Refianda
Mechatronics xiant
TUNGSRAM PARUS
VGD TSGrow UbIQD
HORTILUX FLUENCE
SOLLUM HYPERION

Environmental Monitoring

ioCrops LI-COR
METER VAISALA netsens
Spectrum Technologies, Inc. apogee
SenseNL IREIS NEPON

Crop Monitoring

lunu Paskal ADI
2GROW CORVUS GEARBOX
AGEye PhytSigns
sigrow PHENOSPEX nordetect
Dynamax sendet PRONOVIA
KEYMAKR PLANT DATA

Pest & Disease Monitoring

ecation S
agrocara KOPPERT

Crop Management

B-Mex MyCrops blue radix
Grodan GREEN LABS 30MHz
LETS GROW prospera kotdr
KLAVER4ICT FUJITSU
grownetics Aquaponics AI

Farm Management

agro energy motorleaf
e2ce Adiscover nitea
PRD FIT LABRO ARTEMIS farmsoft
WayBeyond gremon
farmbrite HortiKey
agriculturaldata NATIVE HORTIKEY
Farmanplan MARSIS Agriware
et GROW

Nursery Automation

URIZMATI VISSER HRC
Seiderman ELLEPOT
ISO-GROUP ATLANTIC MAN
mosa FilterSystems clientec
CONIC BC Teq ETAF

Automated Crop Care

SAIA arugga polybee
AGROLABS Micothon

Internal Transport

KG SYSTEMS serg bogerits
CYBERWORKS Logis

Harvest Robotics

Fieldwork Robotics Ltd AGROBOT
Hamill 博和机器人
Panasonic 博和机器人
Dogtooth 博和机器人
vineland M
((kihelm) root AI
Tortuga AgTech OCTINION NEUPEAK

Post-Harvest Automation

VERTIGO TECHNOLOGIES KOPPERT MACHINES
TAKS CALERA TRITA Shituya
Mythronics ellipsa Somas Group
compac futura BBC TECHNOLOGIES
LINITE MARSIS Agriware
OLIMPIAS GREEFA MARSIS Agriware
TOMIRA CRUX AWETA

Industrial Appliances

evogro SMALLHOLD celo fork farms NEXT FOOD
GardenChef farmshelf FARMACY bitmantis
BABYLON hexagro Urban Cultivator VIKING

Container Systems

Urban Kropstek growbox
growtainer AmplifiedAg SHIPSHAPE
alasca life OPCOM FREIGHT FARMS
CROPBOX nthing verde compact GP SOLUTIONS
THRIVE Liberty PRODUCE cubicfarm SYSTEMS CORP FarmBox

Greenhouse Production Systems

VISCON MITSUBISHI CHEMICAL TAP KINOPENG
NGS ECF FOM Satyn Bioponics
FutureFarms Phytoponics GrowPonics PRIS GROUP
eden green AFFINOR VIEMOSE DGS
HYDRONOL AMHIDRO dry
ZIPGROW Hortiplan CHOPKING GREEN AUTOMATION

Sunless Production Systems (Indoor Vertical)

EssenseGrows CODEMA Seven Steps To Heaven
TruLeaf vegreens T-TECH ONEPOTONE bosman van zaal
INFINITEACRES Light4Food NOVAGRIC vegetary
NIJSEN AgriGarden INNO-3B FARMINOVA
AGRIY IFarm VegeFactory CropOne LETTUS GROW
URBAN CROP SOLUTIONS InvertGro GrowStack
EPONIC CERTHON GrowStack
SANANBIO netled E-Grow NOVARBO
HYVE GND BIFARM Farmory

Greenhouse Growers

little leaf B-FOUR AGRO thanet earth ELEMENT 9 FARMS
OROVIVO UNITED FARMS Mucci JUST HORTOPONICS agbatic AgriD
GREENCO AppHarvest Schenkeveld SARA
RED SEA FARMS leaf HORTIKEYS AGROINWEST
COSTA SPISA Sky Lans TAMIMIRA FANTLE
KAGOME REVOL PETER'S GREAT LAKES REDSTAR
MightyVine BRIGHT FARMS HODSWEG HOLLAND
CombVlet WONDRA ASSOCIATES
royalpride. SAC IWATA
AGROKARE sundrop BOTAM
REVOLUTION APS GROUP VERTICAL HARVEST TRITON
SENSEI JD.COM Pure TOMATOES HORTO
svegro XDSHENG editerranea PURE

Sunless Growers (Indoor Vertical)

bever fieldless DREAM HARVEST SPROUT STACK GRONSKA VESAN
AquaVerti Beonstak NORDIC HARVEST BOWERY WANGEE
farmone HARDEE FRESH PINK FRESH VERTICAL ROOTS
OISHII AGRO LUTHERIA Farm deLight URBAN OASIS LITVIO GREENS
infarm NEXTON HARVEST LA CARENNE KALERA f4th
greenLand FUTURE CROPS HyperUrban SPREAD FERME D'HIVER
LEDD WILCO FARMSHIP Urban KISSON Wilder Fields WTR
IRON BOX Farm5 Planet Farms LED FARM elevate Plenty
AeroFarms Young Living Herbs LIVING GREENS NICE GREENE bodor
SageGreen stacked farm SMOGROW Square Roots
uns 80 ACRES FARMS health farm FRESH BOXE
AGRICOOOL Jun Sun Infinite Harvest JFCO agrUz



Large venture-capital transactions in agrotech in 2020-2021

Not included on the list are transactions with grocery and prepared foods delivery companies, since they belong more to the electronic commerce and logistics sector than to agrotechnologies. It is worth noting that very large investment transactions were taking place in the delivery sphere over the last two years: for example, [Gorillas](#), a German grocery delivery company that has its own “dark kitchens”, raised about \$1 billion, and the Chinese community grocery shopping platform [Xingsheng Youxuan](#) got \$2 billion from investors, while the Indian prepared foods delivery service [Swiggy](#) raised \$2.05 billion in two rounds over the year.



Two large IPOs likewise took place in the past year: [Benson Hill](#), a producer of pea and soybean based alternatives to meat products, raised \$1.35 billion, while [Greenlight Biosciences](#), a developer of molecular solutions for controlling insect populations and soil quality, raised \$1.2 billion.



Transactions in “clean” agrotech



Company	Size of round	Description of the company's sphere of activity	Investors in the round
<p><u>Impossible Foods</u></p> <p>(USA)</p>	\$500 million in 2021	Production of meat food product analogues from plant-based raw material. The company's products are sold in 22 thousand stores and 40 thousand restaurants all over the world.	Mirae Asset Global Investments
<p><u>Pivot Bio</u></p> <p>(USA)</p>	\$430 million in 2021	The company produces agents out of nitrogen-generating bacteria for fertilizing plantings — above all corn. The bacteria release nitrogen into the soil only when the plants actually need it. In such a manner, it is possible to avoid overusing nitrogen and polluting groundwater with it. Besides that, Pivot Bio's technology allows farmers to stop using synthetic nitrogen, which is produced in a non-environmentally-friendly way that harms the climate.	The round was led by DCVC and Temasek . Likewise participating: Generation Investment Management , G2 Venture Partners , Rockefeller Capital Management , Breakthrough Energy Ventures , Continental Grain Company , Prelude Ventures , Bunge Ventures ; Tekfen Ventures
<p><u>Plenty</u></p> <p>(USA)</p>	\$400 million in 2022	Developer and operator of vertical farms	One Madison Group , JS Capital , Walmart, SoftBank Vision Fund 1
<p><u>Perfect Day</u></p> <p>(USA)</p>	\$350 million in 2021	The company produces alternatives to meat and milk products, creating a protein containing all 9 essential amino acids. The protein is produced by a fungus first discovered in the geothermal springs of Yellowstone National Park.	Leading investors in the round – the Singaporean fund Temasek and the Canadian pension fund Canada Pension Plan Investment Board
<p><u>Nature's Fynd</u></p> <p>(USA)</p>	\$350 million in 2021	The company produces alternatives to meat and milk products, creating a protein containing all 9 essential amino acids. The protein is produced by a fungus first discovered in the geothermal springs of Yellowstone National Park.	The round was led by SoftBank's Vision Fund 2 . Likewise participating: Blackstone Strategic Partners , Balyasny Asset Management , Hillhouse Investment , EDBI , SK Inc , Hongkou Capital , Breakthrough Energy Ventures

Overview of changes in supply chains in connection with the war in Ukraine

The state of agrotech in Russia and Eastern Europe

The agricultural sector in Europe finds itself in a turbulent state. On the one hand, climate change is bringing about ever more negative weather phenomena, which are particularly affecting southern Europe. According to experts' forecasts, by the year 2100, the acreage of agricultural lands in Europe may be reduced by 80%, given that right now Europe grows $\frac{1}{8}$ of the world's volume of grain products and produces $\frac{2}{3}$ of the entire volume of wine and $\frac{3}{4}$ of the volume of olive oil. On the other hand, the war in Ukraine is going to lead to a decline in the volumes of supply of agricultural products from the region, given that Ukraine and Russia together supply 29% of all the wheat and 62% of the sunflower oil, while the Near East and Africa account for a significant part of their export.



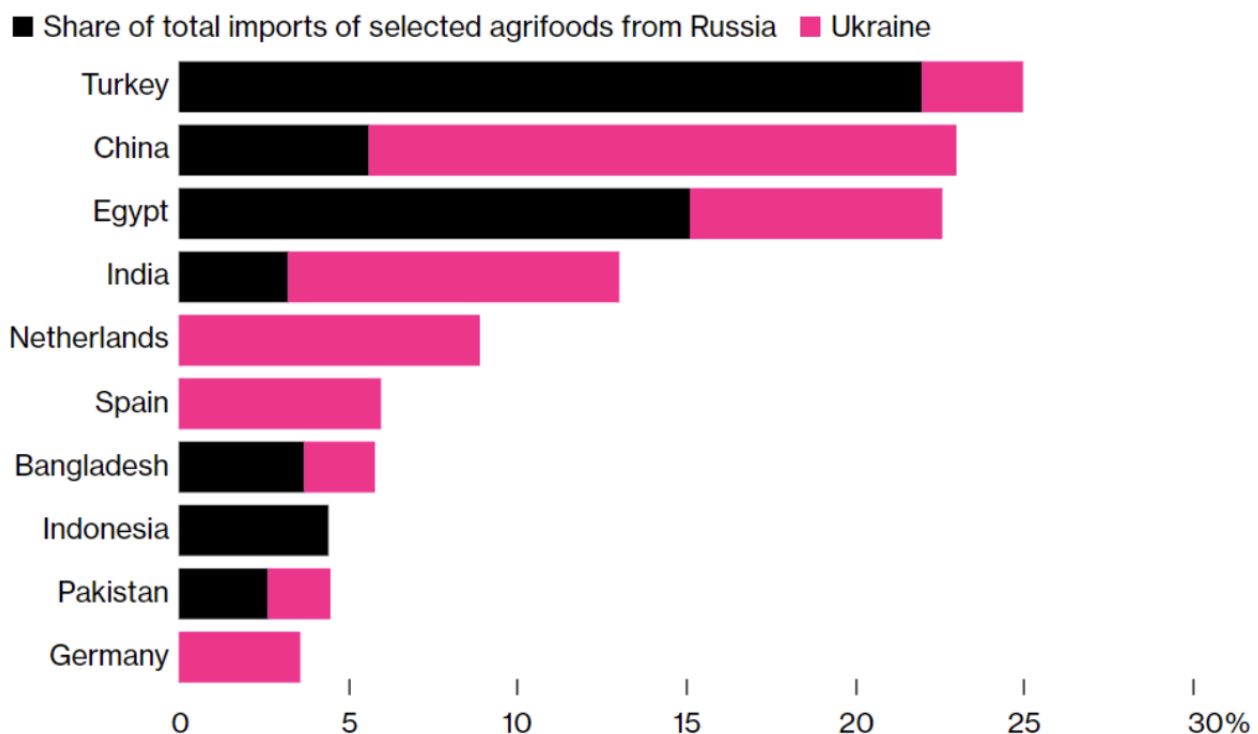
Is export of grain from Russia and Ukraine being planned in the year ahead?

Ukraine accounts for about 10% of the world's export of wheat and corn, Russia for yet another 15% or so of grain export. That said, Russia has significantly improved the quality of the wheat grown in recent years, and feed grain now accounts for only 13% of the harvest, while the rest is "soft" wheat of different classes.

Countries that depend on the import of Russian and Ukrainian grain:

Food Dependence

Turkey and China are among countries reliant on Ukraine's food exports



Source: UN Comtrade data
Shows reliance for wheat, barley, corn, colza seeds and sunflower oil and seeds

Ukraine



Based on the results for April 2022, export comprised 25% of regular volumes; however, the EU, the UNO, and Turkey are undertaking measures to help Ukraine raise that to 75% of the regular. 20 million tons of grain being stored in the ports of Ukraine are under threat of rotting.

Based on the results for April 2022, export comprised 25% of regular volumes; however, the EU, the UNO, and Turkey are undertaking measures to help Ukraine raise that to 75% of the regular. 20 million tons of grain being stored in the ports of Ukraine are under threat of rotting.As of the given moment, export is complicated by two problems: the blockage of seaports by the Russian navy and mines, as well as a shortage of fuel for agricultural machinery. In order not to allow the existing grain to rot, Ukraine needs to export 20 million tons in June–August, that is around 7 million tons a month; that said, in April it managed to bring out just 1.2 million tons. According to the estimate of EU diplomatic representatives in Ukraine, unless the Black Sea ports are unblocked, it will be possible to export no more than 5 million tons by the end of August, that is 25% of the needed volume. The gathering of the new harvest will begin in August, and then the already existing grain is going to have to be disposed off. In May, the EU announced about the rollout of a program to bring 4 million tons of grain out from Ukraine per month using overland routes through Poland, Romania, Hungary, and Slovakia. To what extent it will prove possible to implement the plan is not clear yet, because standing in the way of its implementation are:

- A different type of railroad tracks that is used in Ukraine in comparison with the EU countries: all railcars need to be “get their boots changed” by being transferred onto other bogies when they cross the border.
- A shortage of transportation equipment.
- Long queues for trucks on Ukraine’s borders with other countries.

At the same time, Turkey is actively participating in negotiations to provide a corridor on the Black Sea for bringing out Ukrainian grain to importers. Russia is demanding a lifting of the part of the EU’s sanctions that concerns insurance, and of a prohibition on the import by Ukrainian ships of weapons through ports, while Turkey is proposing to provide protection for Ukrainian ships on the Black Sea for the transport of grain. It is expected that an agreement may be reached with respect to these items in June.

Russia



Export has fallen by about 30% compared with last year. The main reasons are the exhaustion of suppliers' quotas and a drop in prices for grain. The volume of reduction in new contracts for deliveries due to Russia's inability to enter EU ports and insure cargoes because of sanctions is noticeable; however, sales continue, while world prices for wheat have already risen by 50%. Most likely, export is going to continue, but Russia is going to be bearing greater vessel servicing costs. The large shippers-traders Cargill and Vitol are continuing to work with Russian grain even in the conditions of the sanctions restrictions.

According to forecasts, the volume of export of wheat from Russia in April was supposed to have fallen to 1.7–2.1 million tons, against 2.2 million tons in March, forecasts «Sovecon». «Sovecon» director Andrey Sizov associates the decrease in of the rates of export with the exhaustion of quotas for many exporters toward the end of the season. Besides that, even though the Azovian ports are working, a switching over of shipments to Black Sea terminals is taking place, which likewise impacts the rates. According to Sizov's estimate, the RF can export less than 5 million tons of wheat over April–June, while the monthly rates through the end of the season are going to be at a level of 1.7 million tons. According to the Ministry of Agriculture's data, from the beginning of the season through 10 March Russia exported 23 million tons of wheat — 30.9% less than a year earlier.

In all, last year Russia supplied grain to 95 countries last year; that said, right now the main buyers are Turkey, Iran, Libya, and Egypt. After the start of the war, Russia likewise started shipments of grain to Israel, which had previously been buying product from Ukraine, and ramped up shipments to Turkey. According to Bloomberg's estimate for May 2022, world prices for wheat increased by 50%, which is bringing additional income to Russia, and besides this, because of good weather in Russia, a record harvest is expected based on the results of the 2022 season. This is allowing Russia to make up for the increase in prices for servicing and insuring Russian vessels and the shortage of new clients.

«Sovecon» is forecasting the export of wheat from the RF based on the results of the season in a volume of 33.9 million tons, more or less the same level as last year.

Against the background of the RF's military operation in the Ukraine, a series of large wheat importers may pass up Black Sea grain for some period of time. For example, for the first time in several years, there was no wheat from the Black Sea region at the Saudi state company SAGO's April tender with delivery in September. At the same time, agricultural producers in the south, who were in no hurry to sell grain on the domestic market due to the fall in prices, have by now accumulated huge stocks. Exporters may resume purchases of wheat on the fallen market in May–June against deliveries in the new season. The large shippers-traders Cargill and Viterra are continuing as before to work with Russia.

At the same time, Russia is trying to regulate prices on the market and to control export volumes by way of a prohibition on the re-export of grain through the EAEU countries. On 31 December 2021, the Government of Russia confirmed a quota on the export of grain in an amount of 11 million tons in the period from 15 February through 30 June 2022 for export beyond the confines of the EAEU. However, since the export concerns grain, it is possible that exporters will start getting around the prohibitions through a partial switch to export of flour.



From where will grain be imported into Russia in the conditions of the sanctions?

[The war in Ukraine is not likely to noticeably affect the import of grain into Russia.](#)

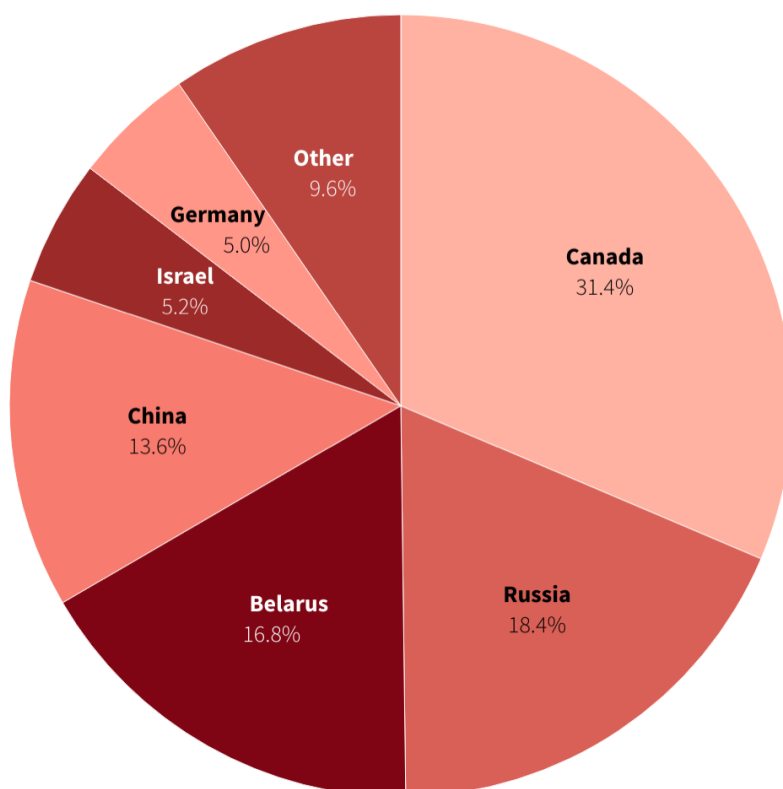
The volumes of import of grain into Russia are extremely small in comparison with the volumes of export: for example, throughout 2020, \$66.6 million worth of wheat was imported, while \$10.1 billion worth was taken out as export. Based on 2021 results, Russia imported 164.4 thousand tons of cereals, while 32.9 million tons of wheat and meslin went for export. That said, the principal importers of cereals into Russia were Kazakhstan, the UAE, and Belarus, i.e. countries that had held back from introducing harsh sanctions addressed at the RF.

Where are Russia and other developing countries going to be buying quality soil for planting if previously its principal supplier had been Ukraine?

I did not find information on purchases of soil or biohumus, but then information with respect to the mineral fertilizers market, in which Russia had been one of the leaders before the launching of the war, is relevant. See below.

Sanctions leave a void in global potash production

Russia and Belarus together made up about 35% of output in 2020



The impact of the military conflict in the Ukraine on the mineral fertilizers market



A shortage of fertilizers is not being foreseen; demand in the EU is satisfied by Western producers, who have ramped up production volumes, while Russian producers are going to concentrate completely on the markets of Latin America and Asia. That being said, prices for fertilizers are going to hold at a level higher than the historical maximum reached in 2008, +30–50% in comparison with 2021.

Since the start of the operation in the Ukraine, the cost of nitrogen fertilizers in the world has shot up by 40–50%, and that of phosphorus and potassium fertilizers by approximately 30%. Russia and Belarus had been large suppliers of such fertilizers; however, “Belaruskali” had fallen under the EU sanctions already in 2021, while the problems with Russian deliveries are principally logistical: for March 2022, transshipments of fertilizers by railroad in Russia dropped by 40%, EU ports have stopped receiving Russian vessels, and there are problems with overland shipments as well. This has had an impact on fertilizer prices. That said, even though the EU did introduce quotas on shipments of Russian fertilizers as a form of sanctions, these quotas more or less correspond to the average volume of fertilizer import by the region from the RF in previous years.

There will likely be no shortage of fertilizers on the international market: the biggest foreign producers have significantly ramped up sales volumes over the first quarter of 2022: Nutrien Ltd. by +64% in comparison with last year, Mosaic. Co by 77%, and CF Industries Holdings Inc by +147%. In such a manner, they are going to cover the unmet demand, but at elevated prices. Russian producers, above all “FosAgro,” are in the meantime going to reorient themselves toward Latin America and Asia, which had been the principal markets in recent times anyway. The corresponding restructuring of logistics chains is going to continue to the fall of 2022 inclusive.

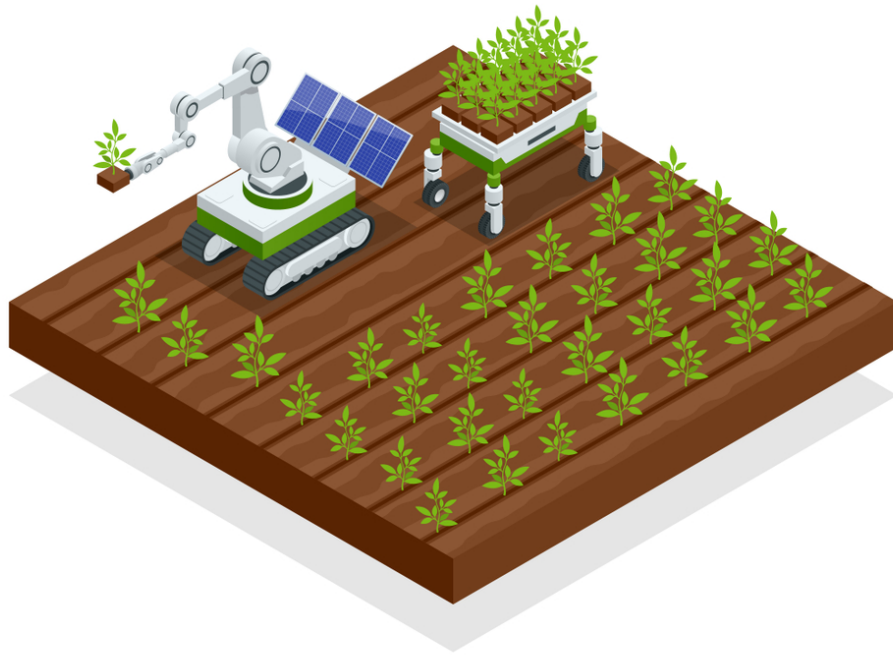
At the same time, the rise in fertilizer prices is reducing agricultural enterprises’ profitability and/or harvest volumes as they cut back on fertilizer use to reduce costs. For reference — Russia’s and Belarus’s shares on the international potassium fertilizer market before the introduction of sanctions and the launching of the war.

What countries and enterprises can win from the change in supply chains in the agromarket in the course of the year?



- 1** As was said above, the mineral fertilizers market is changing. The shortfall of fertilizers to the EU is being made up by companies from the USA and Britain, which are ramping up production, while Russia is going to completely reorient itself toward the markets of Latin America and Asia.
- 2** If the EU's plan to bring out grain from Ukraine through countries located along the border is implemented, then the principal beneficiaries of the new transportation chains will become Romania and Poland, which will account for the greater part of the traffic.
- 3** Because of the crisis in the market for agricultural products, grain processors who buy from different sources, process it into several types of products, and transport it independently are at an advantage. Based on the results of the first quarter of 2022, such large companies as Bunge (USA) and Archer-Daniels-Midland (USA) have shown some of the best financial results in their history.
- 4** The UNO is forecasting a rise in prices for food products output by 8–22% by the end of the year.
- 5** Australia, which has been significantly ramping up the export of wheat in the past few years, will most likely be one of the beneficiaries of the military conflict in the Ukraine, since its logistics chains have not been disturbed, and the energy crisis in the EU has not impacted it. The same thing applies to India as well.

Promising early stage projects



FOR THE PURPOSES OF THIS REPORT, WE SHALL REGARD AS EARLY STAGE START-UPS THOSE COMPANIES THAT HAVE RAISED INVESTMENTS IN A VOLUME NOT GREATER THAN \$15 MILLION; THAT IS THOSE THAT HAVE ADVANCED TO THE ROUND A STAGE.

Russia



iFarm

Investments received: In 2020, they raised \$5 million in investments from Gagarin Capital, Matrix Capital, Impulse VC, IMI.VC, and a series of business angels.

Description of company:

The company specializes in the construction and servicing of semi-automated vertical farms at which lettuces, vegetables, and strawberries are grown. There were five lettuce farms and one strawberry one working as of the end of 2021 (Russian, Switzerland, Finland); another 9 farms were being built (among them Qatar, France, Germany, and El Salvador) and 12 were in the planning stages. I recommend the [iFarm report for the year 2021](#), which graphically tells about how the company's business is set up.

Agro.Club

Investments received: In the middle of 2021, the company raised \$5 million in investments from the Dutch fund Rabo Frontier Ventures and the Greek VentureFriend, and before this, \$1.5 million in investments from the Elevator Ventures fund, which is a part of Raiffeisenbank, and the Speedinvest investment fund.

Description of company:

In Russia, the company is developing a marketplace for entering into transactions for the purchase-sale of grain with possible subsequent follow-up support (processing of the transactions, organization of logistics, et al.). According to the platform's data, more than 17,000 farmers are now connected to it. In North America and Europe, the company offers IT solutions for sellers of goods for agriculture (seeds, crop protection agents, fertilizers). With the help of this system, one can track the movement of products, make individual offers to buyers, and analyze the dynamics of sales, and on the basis of these data, offer them recommendations about how to increase efficiency. Agro.Club does not disclose financial indicators in detail, but does specify more precisely that turnover in 2020 comprised \$40 million.

Ksitest

Investments received: The company raised pre-seed investments, but their sum and source were not disclosed.

Description of company:

The company offers genomic selective breeding services, which allow farmers to optimize the breeding value of cattle and achieve better indicators with respect to herd health and productivity. With the help of software and training from Ksitest, farmers can independently control for these indicators and choose the most advantageous pairs of animals for cross-breeding. The company's services are available in 11 regions of Russia already; that said, this is the only company in Russia and the CIS that has the status of an accredited center for ICAR interpretation of DNA data. Over the past two years, Ksitest has won contracts for systemic genomic selective breeding in the Udmurt and Chuvash Republics. One can read in more detail about how the company's business is set up in [its report for the year 2021](#). From it can be seen that by the end of 2021, Ksitest had genotyped around 20,000 animals, and has genomic data on 300+ thousand head of cattle at its disposal.

Entoprotech

Investments received:

In 2021, the company raised \$2 million from the Israeli agro-holding Granot with the prospect of getting an additional \$28 million by the end of 2022 upon meeting KPIs.

Description of company:

The company engages in the processing of organic waste with the help of insects. Formed as a result of the processing is protein which, in the form of a powder, can be used in the production of functional food products, as well as entomological fat, which potentially can be used in the production of cosmetics. As a by-product, "Entoprotech" likewise puts out fertilizers. At first, the company's business was developing in Russia, where its production facilities are located, but later an office and an R&D center were opened in Israel. In 2022, it is planned to complete construction of a new factory for the processing of waste with a capacity of 150 tons per day.

GreenWise

Investments received: GreenWise is being financed on account of the funds of the founders and of an unnamed investor; the overall volume of investments comprised around 30 million rubles.

Description of company:

The company specializes in the production of plant, fungal, and cellular alternatives to meat. Based on the results of 2020, earnings comprised 20 million rubles; the company's products were being sold in Russia, Belarus, Ukraine, Kazakhstan, and Latvia. Since 2021 GreenWise raw material is being used in the food production of "Yandex.Lavka". The company has founded the Russian [Association of Alternative Food Products Producers](#).

Eastern Europe

Presented in the list are start-ups oriented at the international market.



Agremo (Serbia)

Investments received: In 2018, the company raised 600,000 euros in seed investments; there is no information about more recent rounds.

Earnings: Agremo's earnings were supposed to have reached 1 million euros by the end of 2021.

Description of company:

The company was founded in Serbia; it now has an office in the USA. Agremo offers software and thought tools for analyzing the condition of a field, including by taking account of data obtained from cameras and drones. The company's software can analyze fields with 100 different types of plants. With the help of the company's software, farmers can build a map of a field and keep track of plants that have been affected by pests or are in need of additional fertilizer or irrigation, as well as finding zones that have been overgrown with weeds, calculating the yield of the field, and carrying out other tasks connected with the future harvest.

OneSoil (Belarus)

Investments received: In 2021, the company raised \$5 million in financing from the funds Almaz Capital and PortfoLion.

Earnings: The business's earnings on the whole are not disclosed; the founders report that as of 2021 this was "a sum with six zeroes".

Description of company:

The company was founded by citizens of Belarus, but today is based in Switzerland and is working with clients throughout the world. OneSoil offers software that uses artificial intelligence to analyze data on the condition of fields from satellite photos and data from the client's agricultural equipment. Thanks to OneSoil, one can remotely keep track of vegetation on fields and see the zones that require additional fertilizer or irrigation. Thanks to this, fertilizers are applied with surgical precision, in a dose that corresponds to the condition of the soil in each concrete part of the field, and the yield of the field levels out. As of the middle of 2021, around 200,000 farmers in 180 countries of the world were using OneSoil's solution. The start-up's applications are free for farmers. The company earns its money from offering analytics on the condition of fields and agricultural crops in different countries to market participants: producers of seeds and fertilizers and insurance companies. The start-up has about 15 such contracts, including with BASF and Krone. The b2c sales direction has been gradually developing since 2020: the company has started up production of modems and weather stations for farmers.

Nasekomo (Bulgaria)

Investments received: The company has raised 10 million euros in the form of investments over the past 4 years; the names of the investors are not being disclosed.

Description of company:

The company produces feed for fish and domestic animals, as well as fertilizers from organic waste with the help of insects (black soldier fly larvae). Nasekomo solves several problems at once:

- It brings back into the diet of fish and animals the entomological protein that is customary for their natural diet and increases their immunity;
- It processes waste;
- It reduces the harm to the climate from agriculture thanks to increasing the fertility of soils and reducing agricultural enterprises' need for fresh water and for clear-cutting of trees for new cultivation areas.

The company's production facilities are found in Bulgaria; its target markets — Greece, Turkey, and Western Europe. In 2020, Nasekomo entered into a partnership with the French company [Groupe Grimaud](#) with the aim of jointly conducting genetic selective breeding of insects in order to increase Nasekomo's productivity.

Plantalux (Poland)

Investments received: In January 2022, Plantalux raised 1.2 million euros in seed investments from the fund JR Holidng ASI.

Description of company:

The Polish company Plantalux puts out specialized LED lamps for vertical farms and greenhouses, which can be adjusted for different types of plants and allow a savings on electricity expenses in comparison with the use of traditional greenhouse lighting. The company's principal clients right now are enterprises for the growing of vegetables (tomatoes, peppers) and hemp, including medicinal. The principal markets with which Plantalux is working right now are Kazakhstan, Greece, Russia, and The Netherlands.

eAgronom (Estonia)

Investments received: In February 2022 the company raised 7.4 million euros in investments from Yolo Investments, ZGI Capital, Trind VC, Iron Wolf Capital, and United Angels VC. The start-up's overall volume of financing reached 12 million euros.

Earnings: Data with respect to earnings are not disclosed, but it is reported that eAgronom services 1500 agricultural enterprises.

Description of company:

The company offers software to the owners of farms for analyzing the profitability of a harvest and obtaining carbon credits. The software analyzes historical data for the user's farm and with the help of artificial intelligence gives recommendations on increasing margins and optimizing costs. Right now eAgronom is developing its own tools for tracking carbon emissions and is scaling up to the markets of Asia, where the system of carbon credits is not yet as developed as it is in Europe.

European start-ups in the sphere of applying artificial intelligence in agriculture (data analysis and robotics)



In this segment there is a multitude of large start-ups that have each raised more than \$20 million in investments — for example, [CropX](#), [Phytech](#), [Taranis](#), and [AgNext](#). One of the leaders in the market is Israel. Below are examples of more early stage projects that meet the “less than \$15 million in financing” requirement.

Intterra (Russia)

Investments received: in 2020 the company received a round of investments from the business angel Nikita Shashkin with the potential of increasing the volume of financing to \$10 million in the next couple of years.

Earnings: comprised 84,452,000 rubles in 2020; there are no data for 2021.

Description of company:

The company made it into the survey because even though it is Russian, it is already present in the markets of Kazakhstan and other countries of Central Asia, as well as developing business in India and Iran (data on the basis of a list of employees in LinkedIn). The technology has good potential for relocation; the company itself has announced about plans to expand to the markets of Eastern Europe.

Intterra has developed SkyScout — software for remote monitoring of fields via aerial photographs and data on weather changes.

The main tasks of such monitoring are assessment of the phytosanitary situation and the irrigation needs of the plants, as well as reduction of the quantity of required visits by the farm’s employees to the fields. Besides analytics, through SkyScout one can obtain consultations with specialists in agriculture.

In Russia, the company has, besides not-large enterprises, four large clients — the large pesticides supplier “Avgust”, the fertilizers supplier “Phosagro”, “Shchelkovo Agrokhim”, and RusAg bank. «Phosagro» is working with Intterra on a project for remote diagnostics and optimization of the use of mineral fertilizers on the fields of the network’s clients.

Investments raised will be spent on the creation of a marketplace for the sale of PPAs, seeds, and fertilizers, a marketplace for financial services for farms, and expansion into Eastern Europe.

Proofminder (Hungary)

Investments received: no data. Right now, the project is found in the [Nextcelerator](#) accelerator, graduates of which get access to financing through the crowdfunding platform [Seedblink](#).

Description of company:

The company's software allows omnifaceted analytics to be obtained for planted crops: intensity of flowering, health of plants, assessment of soil productivity depending on its condition, assessment of the yield and profitability of a field. Besides that, Proofminder's solution allows insurance companies to assess the risks of insuring a farm. The analytics are gathered by way of processing images from drones flying over a field, and the processing of these and historical data with artificial intelligence.

On the whole, the main task of Proofminder's software is optimization of the rate of return for agricultural lands and viticulture. This is [written](#) about in detail on the company's website.

Fermata (Russia/Israel/Canada)

Investments received: 2020 — \$3.7 million from Massa Innovations, 2019 — \$1.1 million from a private investor, before this — a grant from the Innovation Promotion Fund.

Description of company:

The company was founded in Belgorod; it is now based in Israel and this year it opened an office in Canada and hired a Canadian team to gain ground in [North America](#).

Fermata produces software that determines the damage to plants from diseases or insects with

the help of artificial intelligence from images from video cameras and drones with the help of artificial vision. Identifying an infection at an early stage allows harvest losses to be reduced by 30%. The system for warning of the cause of problems in the field reduces the reaction time on the part of a farm's employees by 50%. Fermata's software likewise gathers data on changes in the weather and allows the yield and rate of return of fields to be predicted on the basis of the entire array of data.

Agrieye (Ukraine/Estonia)

Investments received: \$150,000 from a Ukrainian business angel in 2016 and \$130,000 from Starta Ventures in 2017. There are no data on more recent rounds.

Description of company:

Agrieye uses photos of fields taken from drones with the help of a multiple-spectrum camera, as well as satellite photos to determine where it is necessary for farmers to take samples for chemical soil analysis. When the analysis is done, an online service creates a precise map of the field, describing its chemical condition (nitrates, phosphorus, and potassium) and the condition of the vegetation. After that, when the data are being processed, artificial intelligence forms a map with an indication of where it is required to apply fertilizers and herbicides and in what quantities, which helps optimize and reduce the use of chemicals.

Having combined the technologies of chemical analysis, remote sensing, and cartography, Agrieye offers a cheap solution (\$2 per hectare) capable of saving up to 30% of expenditures on crop farming on account of optimization of the condition of the soil.

Connecterra (The Netherlands)

Investments received: \$8.8 million in 2020 from ADM Capital, Kersia, Put Your Money Where Your Meaning Is Community, and Sistema VC, as well as \$4.9 million in 2018 from AgFunder and Sistema VC.

Description of company:

The company is present on the list as an example of a large start-up that has been financed at the early stage by a Russian venture fund — Sistema VC (a subsidiary fund of AFK “Sistema”).

Connecterra has developed software which optimizes care for cows on dairy farms with the help of artificial intelligence. Thanks to the company’s analytics, an enterprise can reduce the consumption of antibiotics by 50%, forgo hormonal agents, and increase the profitability of the farm. Connecterra has large clients — Danone and Bayer. *Insurtech in agro: an overview of start-ups oriented at insuring farmers against weather conditions*

There are practically no Eastern European projects in this sphere; for this reason, I am giving examples of start-ups working for the European, African, and Asian markets. On the whole in the agricultural sector, insurtech is currently aimed at insuring small farms in poor regions.

Pula (Kenya)

Investments raised: They raised \$6 million in January 2021 within the framework of round A. Investors — TLcom Capital and Women’s World Banking. In 2018, they were likewise raising \$1 million in seed investments from Rocher Participations, Accion Venture Lab, Omidyar Network, and several business angels.

Description of company:

Pula — an innovative insurance company, which is working in the markets of 13 African countries and insures the harvest and livestock populations. It has created a digital system for assessing the rate of return of a farm and weather conditions, which allows for remote calculation of the cost of insurance.

The traditional way of assessing risks and the amount of an insurance premium includes a visit to the farm. This is something that American insurance companies, for example, can afford, because the average amount of the premium there is \$1000, but in Africa, farms are smaller in size and much poorer; for this reason, a premium comprises around \$4, and an insurance company cannot afford visits. For this reason, earlier many farms did not get insured in Africa —despite the fact that Africa accounts for 17% of Earth’s fertile land, only 1% of all insurance premiums are attributable to it. Pula is solving this problem, having changed the methodology for calculating premiums to a fully remote one, without visits to farms.

In its product, Area Yield Index Insurance, the company uses machine learning, the data of crop-cut experiments, and data on weather conditions and farmers’ losses, on the basis of which the risks and price parameters of the insurance are calculated. Used for insuring livestock is a similar methodology, which assesses the risks of a lack of sufficient vegetation to feed the livestock and of diseases.

The insurance is not sold to farmers directly. Instead, Pula works with the banks and financial organizations that give the farmers loans and require them to insure the harvest and the head of livestock as part of the transaction.

IBISA (Luxembourg)

Investments raised: 1.5 million euros at the end of 2021 from the specialized British fund Insurtech Gateway and Rockstart's AgriFood.

Description of company:

IBISA — this is an online platform that offers data and tools for preparing insurance documentation to insurance companies, microfinance organizations, cooperatives, state agencies, and trade associations for insuring small farms in developing regions (India, Niger, The Philippines). With the help of IBISA, one can assess weather risks and assess insurance losses.

OKO (Luxembourg)

Investments raised: \$1.2 million in 2021 from Newfund and ResiliAnce; a grant within the EU's Horizon 2020 program

Description of company:

OKO offers automated insurance services to farmers, using satellite data and mobile payments with the use of text message codes. The insurance covers losses from floods and drought. For now the company is working in the markets of Mali and Uganda; that said, in Mali as of 2021 it had 7000 paying clients. Besides the b2c market, the company is trying to work in the b2b market as well, offering services to corporations that have many suppliers among agricultural enterprises — for example AbInBev.

OKO is a 2018 graduate of the Techstars accelerator.

Start-ups from Eastern Europe working with organic waste



Ottan Studio (Turkey)

Description of company:

Ottan Studio produces bio-composite materials from plant waste (fruit peelings, grass, spoiled food products), which can replace materials made of wood, stone, or marble. The materials are suitable for use in the production of furniture, interior items, wall coverings, lamps, and automobile passenger compartment components. The company's target audience is architects and furniture and luxury goods designers. Ottan Studio is orienting itself at the markets of the EU and the Near East (UAE). In May 2022, they won the Emaar Innovation Challenge competition in Dubai and the right to launch a joint pilot project with the large Emirati developer Emaar. In 2021, they [made it](#) into the MassChallenge accelerator program, as well as participating in competitions of start-ups in Britain and Dubai.

BioMyc (Bulgaria)

Investments raised: 92,000 euros in the form of a grant from EIT Climate KIC and Cleantech Bulgaria, as well as own funds. Since 2021 it is self-supporting.

Earnings: no data, but it is self-supporting.

Description of company:

Biomyc — a company that is engaged in R&D and design in the sphere of production of packaging and components from waste and biodegradable raw material. Biomyc uses mycelium composite and renewable materials in the process of developing the product, and can create packaging of complex geometric forms tailored to the customer's temperature, color, and other requirements. In so doing waste from the customer's own production operations becomes the raw material for the packaging. Production of projects developed by Biomyc is implemented through joint ventures with the Netherlands company [Grown.bio](#), which produces packaging from mycelium, and the Bulgarian 3D printing company [B2N](#). For expansion to Asian markets, they are seeking on-site partners in Asia.

Among Biomyc's clients there are such large companies as Mercedes-Benz (one can [read in detail](#) about the case with them) and British American Tobacco. The company's founder has [made the list](#) of Forbes 30 under 30.

Soma Bioworks (Serbia)

Investments raised: in June 2022, they won the competition of the Montenegrin incubator [DigitalDen](#) and are expecting \$100,000 in investments and with entering the USA market from it. Besides this, they were pursuing grants from the government of Serbia and the EU and have entered into a partnership with Philip Morris.

Detailed description of products: [brochure](#)

Description of company:

SOMA produces a series of products made of biodegradable raw material, which is created from waste with the help of mushrooms:

1. Biosporin — a biodegradable material, suitable for the production of packaging and construction materials. Fire-retardant, it retains heat, and is light and flexible. It is produced from the waste from farms and wood processing operations, and when it decomposes it turns into fertilizer. Biosporin — this is an analogue of polystyrene that requires 98% less energy to produce and does not generate wastewater. The material is carbon-negative—0.2 tons of CO₂ are sequestered for each ton of Biosporin produced. Upon the launch of commercial mass production, one ton of Biosporin will prevent the release into the environment of 2.5–3.7 tons of methane, about 150 kg of ash, and about 300 kg of plastic waste.

2. Soma Yoga Block — a prop for yoga, made of biosporin. Can be produced with seeds inside so that plants will grow out of it after disposal.

3. Chitin and Chitosan — biomaterials made of mushrooms and mushroom farm waste, which can be used in the biomedical, food, and cosmetic industries. Chitosan is the only biopolymer in the world that is naturally found with a positive (cationic) electrostatic charge. This gives it bacteriostatic and flocculating properties. Likewise, Chitin and Chitosan possess unique biological properties, which allow them to be used in matrices for the cultivation of tissues, as well as in regenerative medicine, wound dressing material, and scaffolding for accelerating regeneration.

4. Organically grown medicinal mushrooms and their spores.

5. Food supplements made of mushrooms — tea and vitamin supplements for increasing immunity.

It is planned to sell these products as white-label, as well as creating new made-to-order products on their basis.

Likewise, SOMA has developed its own Blockchain-based system for tracking emissions and CO₂ sequestration, which it intends to offer under license to other manufacturing operations.

Zero Wave (Bulgaria)

Investments raised: A grant of about 10,000 euros from the Rinker Youth Challenge competition in 2019 and support from the EU through the Climate-KIC program.

Description of company:

Right now Zero Wave produces crackers with a high protein and fiber content, made from the malt that remains from the production of beer (in Bulgaria alone they throw out 240 tons of it daily). This allows for the quantity of methane generated from beer production waste during decomposition to be reduced. In the future, besides food products, Zero Wave wants to focus on producing biodegradable food containers and eating utensils made from the same malt raw material, and is seeking investments for their mass production. The founder of the company — Denimir Dimitrov.

Zero Waste's products are sold in health food stores in Bulgaria. On the whole, the company is oriented toward the market of the entire European Union, and actively participates in the entrepreneurial events of different countries.

Entoprotech (Russia/Israel)

The company was presented in the previous report, but it is important to show it again in this section.

Investments raised: In 2021, the company raised \$2 million from the Israeli agro-holding Granot with the prospect of getting an additional \$28 million by the end of 2022 upon meeting KPIs.

Earnings: there are no precise data. Based on 2020 results, the Russian legal entity showed 3.3 million rubles in profit, but by 2022, taking the transaction with Granot into account, the indicators should have changed greatly. It can reliably be said that the company crossed the break-even point long ago.

Description of company:

The company engages in the processing of organic waste with the help of insects. Formed as a result of the processing is protein which, in the form of a powder, can be used in the production of functional food products, as well as entomological fat, which potentially can be used in the production of cosmetics. As a by-product, "Entoprotech" likewise puts out fertilizers. At first, the company's business was developing in Russia, where its production facilities are located, but later an office and an R&D center were opened in Israel. Right now, the plant situated in Penza Oblast is meant to process 15 tons of waste per day. Since 2022, a project by a joint venture between Entoprotech and its investor Granot for the production of feed protein from organic waste is being launched in Israel. Right now, "Entoprotech" is one of the top 10 largest enterprises in the world for the processing of organic waste with the help of insects, and the company is planning to make it into the top 5 after the plans with Granot have been carried out.

Entoprotech was founded by the owners of "Damate" — the largest turkey producer in Russia.

Start-ups from Eastern Europe that are engaged in the preservation of fruits for transportation to the place of sale



Agree Net (Italy)

Investments raised: they have received investments from a business angel, who is in the same way consulting on the project with respect to management questions, as well as having received grant support under support programs for entrepreneurship in Italy. The sums are not known.

Description of company:

Agree Net has developed Ally — a biodegradable coating for vegetables and fruits, which is produced from farm waste and extends product shelf life. The main operating principle of the coating is to inhibit oxidation. The use of Ally allows for a reduction in losses for farms and for product to be shipped to more distant points of sale.

The project finds itself at an early stage, is refining its technology in order to increase the useful life of products by 3 times, and is participating in accelerators and entrepreneurial competitions in the EU.

The start-ups that have been found are at the early stage and from Southern Europe, presumably because there are many fruit farms there. From all appearances, the industry is still in its infancy.

Bio2Coat (Spain)

Investments raised: in 2017 they received a grant under the EU's Horizon 2020 program, and after that, support from state techno-parks, while in 2020 they won in the SeedBed Bilbao accelerator and entered into the EIT Food community of European foodtech start-ups funded by the EU. From all appearances, they are in need of investments.

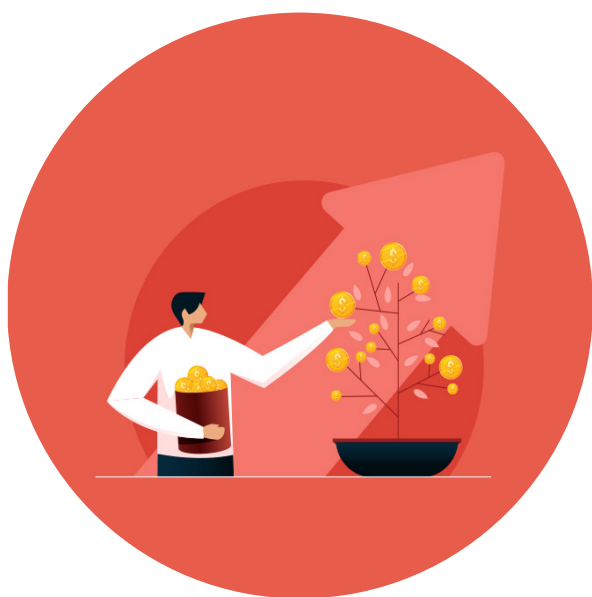
Description of company:

Bio2Coat has developed a natural food coating for fruits, made on an aqueous base in the form of an invisible semi-permeable barrier. The coating slows the evaporation of water from the fruit and protects it from microorganisms. This reduces losses during transportation and storage, and improves the outer appearance, prevents the development of fungi, and does not change the nutritional properties. The solution has undergone testing at strawberry farms in Spain.

The founder of the company is a professor at the Polytechnic University of Catalonia department of materials science, as well as working at yet another company, which may have an impact on the rates of development of his start-up.

Specialized funds that invest in agrotech

Russia



Active in Russia in agrotech are corporate investment structures and state programs for the support of start-ups. As concerns venture capital funds, there are practically no sector-specific ones, but there are isolated transactions by non-sector-specific funds with agro-start-ups.

The “Efko” group of companies Corporate investor

“Efko” — a large producer of food products — focuses on the development of internal innovational projects and taking over outside solutions at an early stage.

The following “Efko” structures support start-ups:

1. The \$50 million [Fuel for Growth](#) venture fund with headquarters in the UAE. The fund finances projects in the sphere of plant-based meat, milk, and sweet proteins and fats made from microorganisms for the markets of Africa and the Near East, in so doing maintaining interest in innovations from Russia.
2. The [Biruch](#) innovation center, which is engaged in R&D in the food industry and biotechnologies

Kirov Group Ventures Corporate investor

The corporate venture capital fund of GK “Kirovsky zavod” with its own accelerator for start-ups. It invests at the pre-seed and seed stage, including in projects from agrotech and machine-building for agricultural needs. They offer start-ups a chance to test their prototypes on the base of the GK’s enterprises, as well as opening up access for them to partners in Israel, Germany, Hungary, and France. In the fund’s portfolio there is, for example, [Agroworld.trade](#) — a b2b platform for trans-border trade in foodstuffs. Average ticket — 0.5–1.5 million euros in one start-up.

Aintrigud **Venture fund**

An early-stages venture fund with a volume of 5 million euros, which was incorporated on Cyprus in 2020. It invests in projects in the food industry sphere with the aim of bringing new food products to the international market. 50% of the funds have been furnished to the fund by its founder Ivan Sidorok, co-owner of NMGK Group. The fund's portfolio already includes 11 Russian start-ups from the [Mabius](#) accelerator, which is affiliated with it.

Skolkovo Foundation Biological and Medical Technologies Cluster **State technopark with financial support of projects**

Inside the biomedical cluster of the "Skolkovo" technopark, there is a "Biotechnology in agriculture and industry" subdivision. It supports projects in the following spheres:

- Genetics and selective breeding
- New medicines, probiotics, and fertilizers
- Digitization of agriculture
- Technologies for the storage and processing of organic raw material and waste
- Industrial biotechnology
- Food technologies
- Engineering solutions for agriculture
- Domestic animals
- Parapharmaceuticals

The cluster offers grants of up to 5 million rubles, lease and refactoring financing, tax incentives, pre-IPO financing in conjunction with VEB.RF (up to 1.5 billion rubles), help in international expansion, offices in the "Skolkovo" Technopark, and many [other services](#).

United Chemical Company **"Uralchem"**

Corporate investor

«[Uralchem](#)» is a big player in the mineral fertilizers market, which has been developing digital services for agriculture in recent years. As is the case with "Efko", "Uralchem" has several subsidiary structures, which finance innovational solutions:

1. [Digital Agro](#) — a "digital" company, which offers farmers analytical tools working on the basis of data from a satellite and sensors. DA takes over start-ups that are engaged in the digitization of agriculture—in particular, in 2020 it bought out a stake in the company "Agrosignal". DA is a leader in the Russian market for IT solutions for agriculture.

2. "Uralchem Innovation" — a subsidiary company of "Uralchem", a resident of "Skolkovo". It specializes in new solutions in the sphere of fertilizers, the digitization of agriculture, and obtaining proteins. It implements R&D on its own and buys up ready-made solutions from the market. As of the middle of 2021, they have put 300 million rubles into the creation of an installation for high-level processing of yellow peas and obtaining isolate (protein) from it. They finance competitions for start-ups, both their own and ones affiliated with "Skolkovo".

Eastern Europe

Eleven (Bulgaria)

Venture capital firm

Specializes in early-stage start-ups from Southeastern Europe. One of the priority directions is new technologies in the food industry. Among the portfolio companies can be noted [Ondo](#) — a producer of smart irrigation systems, climate control, and fertilizer for greenhouses and open fields, and [Pollenity](#), a producer of smart hives for bees. In 9 years, Eleven has invested in 150 companies; the company's third fund will close in 2022 and will comprise 60 million euros.

Astanor Ventures (Belgium)

Venture firm

Europe's largest specialized venture firm that focuses only on agrotech and the food industry. Volume of the fund — \$325 million. Astanor is planning to finance 25–30 companies at rounds A–C and to put from 1 to 20 million euros into each. It regards start-ups from Europe and North America and a broad spectrum of niches in the agrotech market as fitting its profile. Among the projects invested in are an insect farm, a producer of vertical farms, and a producer of sensors for monitoring the condition of plants.

Hiventures (Hungary)

Fund of funds

A Hungarian fund with a volume of 700 million euros, which invests in start-ups from Southeastern Europe at different stages of development—from the very earliest (ticket starting at 200 thousand euros) all the way to growth. In the fund's focus, among others, is agrotech. Listed in the portfolio on the website [are 12 agrotech projects](#), predominantly in the sphere of sensors, software, and bio-pesticides for agriculture.

Five Seasons Ventures (France)

Venture fund

The fund specializes in start-ups in the food industry sphere and is prepared to invest in projects all over Europe. Volume of the fund — 180 million euros. Ticket for one project — from 2 to 10 million euros. A requirement of companies—to have a positive effect on the environment or solving social problems. The start-ups Barkyn, her1, The Nu Company, and vly can be noted in the portfolio.

Funds that finance start-ups having supply chains in agro

Represented in the main in Europe are funds that are placed into start-ups in agriculture as a whole, without a narrow focus on changing supply chains. I give examples of organizations that are worthy of attention:

Sucden Ventures

France

A venture capital fund of the world's largest trader in foodstuffs goods (soft commodities). Specializes in projects in the sphere of supply chains in agriculture and the food industry. There are no data about the volume of the fund.

Yield Lab Europe

Ireland

A European seed stages venture capital fund, which puts from 100,000 euros to 2 million euros into a project. It focuses on European start-ups in the spheres of sustainable farming, including in the sphere of changing supply chains.

Huruma Fund

Spain

A 120 million euro fund, which finances fintech start-ups and IT platforms that serve small and medium sized farms in Latin America, Africa, Asia, and the Caribbean, helping them expand business.

Syngenta Group Ventures

Switzerland

A specialized agrotech fund, which gets placed into start-ups in the sphere of sustainable development of agriculture, including in those that change supply chains and apply artificial intelligence to data from fields. They have put around \$100 million into start-ups since 2009; the portfolio is [accessible on the website](#).

Omnivore Partners

India

A venture capital fund with a volume of \$130 million, which invests in early stage projects in agriculture and the food industry, including in the sphere of changing supply chains and the use of artificial intelligence. The full portfolio [is on the website](#). They are invested in Indian projects, but with the launch of a new fund in 2022, the focus may be replaced.

Infrastructure for relocation of Ukrainian and Russian start-ups beyond the border:

Immigram

Help in relocation

The service helps gather documents, get a recommendation from Tech Nation Endorsement, and file an application to obtain a British Global Talent Visa, oriented at IT specialists and entrepreneurs.

\$500,000 has been put into the start-up by founder of the company PandaDoc Mikita Mikado and the funds Xploration Capital and Joint Journey Ventures. The latter specializes in start-ups with Russian founders.

Joint Journey Ventures

Venture capital fund supporting start-ups with Russian founders

The fund was founded by Sergey Dashkov, who had earlier founded the “Double B” chain of coffee shops in Russia and the Angelsdeck platform for business angels. The Joint Journey fund is based on Cyprus; since 2016, it has put \$36 million into start-ups, predominantly at the seed stage. It sometimes finances the pre-seed stage and rounds A and B.

Angelsdeck

Investment community of business angels

A community of Russian-speaking investors from Europe, the OAE, Asia, and the USA. They are put into start-ups with Russian-speaking founders that are oriented at the international market. After the start of the military operation, they have started more actively developing their presence in Dubai. There are around 800 investors in the community; average ticket — \$500,000.

Migrun

Help in relocation

A platform that automates relocation for entrepreneurs and freelancers to countries that give out entrepreneurial visas or visas for digital nomads. They launched at the end of 2021, and for now are working with 8 countries: Portugal, Spain, Slovakia, Turkey, France, Croatia, Mexico, and Montenegro. They help choose the necessary type of visa, offer checklists of procedures and templates of documents, and choose a suitable consultant for resolving the client's questions

Hello Move

Help in relocation

They develop a relocation strategy for the teams of start-ups, prepare legal documents, and help register a legal entity in the new country of residence.

SpeedUp Group

Venture capital fund

A Polish venture capital fund that gets put into start-ups from Central and Eastern Europe at the early stages—the size of the investments comprises from 50,000 to 4 million euros. The focus: artificial intelligence, fintech, advertising technologies, the internet of things, medicine, and electric cars. Since spring 2022 they are managing the special fund [Ukraine Support Fund](#), initiated by Google. This is a fund with a volume of \$5 million is supposed to put money into 50+ start-ups with Ukrainian founders by the end of 2022 and offer them advertising services from Google for free.

7wings

Grant program

They offer grants in an amount of \$50,000 to Ukrainian start-ups that remain in the country and in so doing have suffered from the combat operations.

Support Ukrainian Startups NOW

Charitable initiative

An initiative of the Ukrainian community of venture and private investors, which is helping Ukrainian IT companies and specialists to continue their work or search for a new location in which to find a job.

Geek Ventures

Venture fund

A venture fund, founded by immigrants from Eastern Europe, which is supporting the start-ups of immigrants (relocated ones). They have launched the initiative [Save Ukrainian Startups](#), which matches Ukrainian start-ups in need of investors and investors desiring to put their money into them.

SID Venture Partners

Venture capital fund

A venture capital fund, which is put into Ukrainian start-ups at the seed stage that are entering the international market.

Hi5 Ventures

Venture capital fund

A Ukrainian venture capital fund, which invests in start-ups from Eastern Europe and helps them with getting investments from American investors with the possibility of relocation. The volume of the fund — \$15 million. Average ticket — from \$250,000 to \$1 million, focus — SaaS, online education, artificial intelligence, cyber security, and cyber sports.

Keep Going

Crowdfunding platform

A Ukrainian crowdfunding platform, which seeks private investors for financial support of Ukrainian small business.

Hypra Fund

Venture capital fund

A venture capital fund, which is put into start-ups in the Web3 field oriented at the international market. The volume of the fund — \$25 million. The fund has just been launched, the founder's LinkedIn: <https://www.linkedin.com/in/igor-pertsiya>

Flyer One Ventures

Venture capital fund

The fund invests in start-ups from Ukraine and the Baltic countries at the seed stage and stage A. Amount of investments — \$100,000–500,000 for seed and \$500,000–\$2 million for A. Focuses on artificial intelligence, online education, B2B SaaS, and medicine. After the start of the war, they [launched an initiative](#) to consult start-ups on optimizing the business model and coming out into Western markets.

The Untitled Ventures

Venture fund

A venture firm with Russian partners and an office in London, which in 2021 launched a 100 million euro specialized fund for relocating early stage start-ups from Eastern Europe into Western markets.



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