



WORM FERTILIZER COOPERATIVE

COMPANY PROFILE

RED WORMS FERTILIZER COMMON PRODUCTION AND MARKETING COOPERATIVE

Saray Mahallesi Yurt Sokak No:5 Kahramankazan/ANKARA

www.solucangubresikooperatifi.com.tr

info@solucangubresikooperatifi.com.tr

0 850 305 23 20

PROTECT

ENVIRONMENT

WHILE

PRODUCING,

PROTECT

YOURSELF WHILE

CONSUMING

As it is known, remnants of pharmaceuticals and chemical fertilizers pollute groundwater and the environment, and more importantly, they pass from soil to agricultural products and people from agricultural products to trigger hereditary diseases.

The fact that these issues are on the agenda in the public opinion increases the consumption of organic products rapidly. As a result of this, the use of **organic fertilizers is becoming widespread in many areas from hobby plant growers to commercial agricultural farmers in the balcony or garden of the house**. This acceleration, which is referred to as “**National Agriculture**” under the name of the agricultural policies of our state, is gradually increasing.

At this point, worm manure has a significant place among the organic fertilizers those are increasing in popularity. Because **it is produced in completely natural ways and does not harm the plants even over used**.

As **Red Worm Fertilizer Cooperative**, we produce and supply **Organic Worm Fertilizer** in order to provide added value to our country and farmers as a result of our long-term research and development activities.

In this context:

- By combining local producers and creating employment,
- Recycling and disposing of waste,
- By supplying a product that will reduce the import of fertilizer

We are working day and night to get rid of the chemical fertilizer of our country's territory with totally domestic capital.

With **Organic KOOP'S® Solid and Liquid Worm Fertilizer** obtained by passing organic wastes through the worm digestion system, we wish to leave healthy soils to our future generations at the same time.

Considering the support of municipalities, public institutions and their affiliates for the production and use of worm manure in America and Canada¹ for years;

It is important that our municipalities, public institutions, farmers and all other related organizations take part in this struggle. For this reason, we make every effort to introduce the miraculous **KOOP'S® Worm Fertilizer** to you.

The Cooperative Center is located in Ankara (the capital city of Turkey) , but operates as the largest cooperative in the industry with over 100 members across 7 geographical regions (entire country) in Turkey. As a result, **the cooperative provides income to thousands of families, including hundreds of small entrepreneurs producing fertilizers and other interacting sectors.**

If **Red Worm Fertilizer Cooperative** is used **by your organization** as solid and liquid forms of worm manure which we produce and sell:

- Promotion of worm manure, as a **“domestic product”**,
- Within the scope of **environmental responsibility**, your organization's wastes will be fed into worms and converted into fertilizer form, and your wastes will be brought to a beneficial shape and disposed of,
- Within the scope of social responsibility, you will support the small producer in your city and you will have created employment.

We would like to thank you for your interest in this purpose and we would like to express our impatience to see you as soon as possible in this national struggle.

¹ <http://compostingcouncil.org/wp/wp-content/uploads/2011/01/Rhonda-L.-Sherman.pdf>

The cooperative is recycling the wastes and prevents chemical fertilizer pollution by the production of organic worm manure.

ABOUT THE COOPERATIVE I

- ☞ Turkey's the only cooperative that appeal to the entire country, unlike other regional cooperatives,
- ☞ Registered to the Chamber of Commerce of Ankara,
- ☞ Under the supervision of the General Directorate of Cooperatives of the Ministry of Commerce,
- ☞ Was founded on May 12, 2016 by 7 people in Ankara,
- ☞ By the end of 2017, the number of members more than 150,
- ☞ Following the increasement of members, in February 2018, a new management was selected by taking into account this structural change.

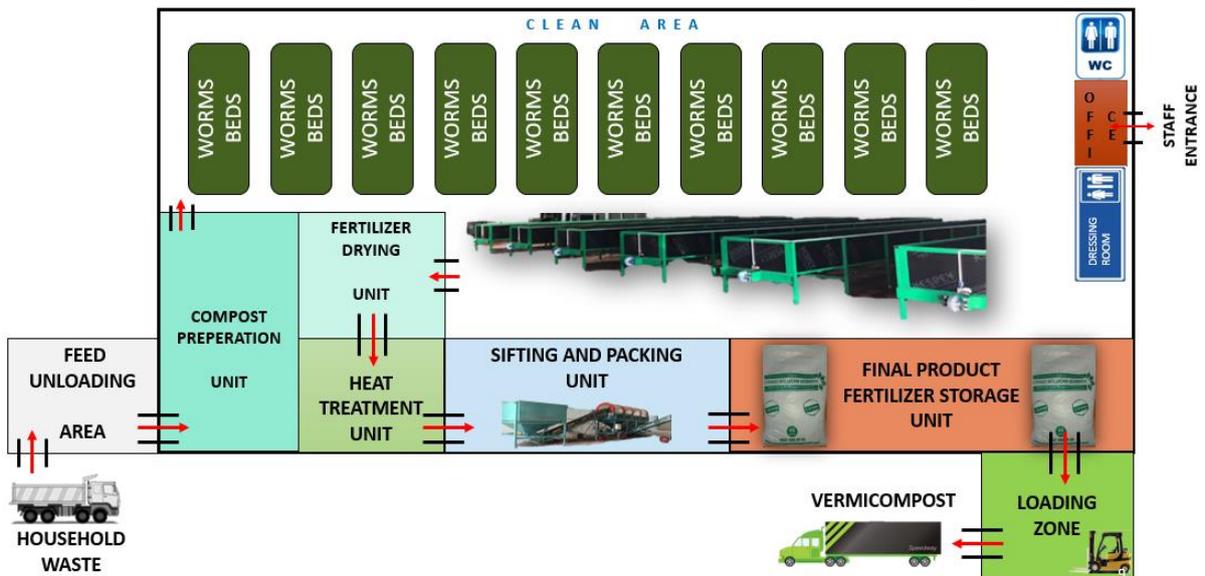


ABOUT THE COOPERATIVE II

With new management;

- Joint production project put into operation,
- Laboratory analysis agreement concluded,
- Website renewed,
- Corporate identity study completed,
- Promotional activities carried out throughout the country,
- In cooperation with Faculty of Agriculture at Ankara University started project on worm manure,
- 2 joint production facilities established in Ankara and Samsun,
- Turkey's the first legal production and sales cooperative,

JOINT PRODUCTION FACILITY MODEL





Ankara Joint Production Facility has;

- 14 Producers,
- 15 million worms,
- 2000 m2 closed area and
- 3700 m2 total area within the industrial area.

ANKARA JOINT PRODUCTION FACILITY HAS



Ankara University Agriculture Faculty
Lecturers and Students Visited Our
Cooperative





Samsun Joint Production Facility has;

- 37 producers,
- 50 million worms,
- 4500 m2 closed area and 40 acres of land.



SAKARYA
JOINT PRODUCTION FACILITY HAS



Sakarya Joint Production Facility has;

- 16 Producers,
- 20 million worms,
- 4800 m2 closed area



As Turkey's biggest Worm Fertilizer Cooperative, we are implementing producers and solution-oriented projects with our farmers to return to the fertile land, to use the power of being together and to bring the values that our farmers deserve.

**We continue to move forward
with the belief that**

WE

ARE

STRONGER

TOGETHER

OFFICIAL DOCUMENTS

Business And Working License by Kahraman Kazan Municipality

T.C.
KAHRAMANKAZAN BELEDİYE BAŞKANLIĞI
İŞYERİ AÇMA VE ÇALIŞMA RUHSATI

Veriliş Tarihi : 10/05/2019
Ruhsat No : 134
Adı Soyadı : S.S. KIRMIZI SOLUCAN GÜBRESİ ORTAK ÜRETİM VE PAZARLAMA KOOPERATİFİ
İşyeri Ünvanı : S.S. KIRMIZI SOLUCAN GÜBRESİ ORTAK ÜRETİM VE PAZARLAMA KOOPERATİFİ
Faaliyet Konusu : ORGANİK GÜBRE ÜRETİMİ
Diğer Faaliyet Konusu :
İşyerinin Adresi : SARAY MAHALLESİ YURT CADDESİ No:5 KAHRAMANKAZAN

İŞYERİNİN SINIFI
Gayri Sıhhi Müessese:X Sınıfı: 2. SINIF

İşyerinin Harca Esas Kullanım Alanı: 3.610,00 m2

3572 Sayılı Kanun ile Buna Çıkarılan Yönetmelik Hükümlerine Göre Hazırlanan İşbu İşyeri Açma ve Çalışma Ruhsatı 10/05/2019 Tarih ve 400357 / Makbuz ile 1.470,90 TL Harç Alınarak Verilmiştir.


M. ERDAL
Başkan Yardımcısı



Provincial Directorate Of Agriculture And Forestry Work Approval Certificate

	T.C. ANKARA VALİLİĞİ İL TARIM VE ORMAN MÜDÜRLÜĞÜ
ÇALIŞMA ONAY BELGESİ	
Tesisin Adı	: S.S. Kırmızı Solucan Gübresi Ortak Üretim ve Pazarlama Kooperatifi
Tesisin Adresi	: Saray Mah. Yurt Cad. No:5 Kahramankazan / ANKARA
Tesisin Faaliyet Alanı	: Organik Gübre ve Toprak Zenginleştirici Üretimi (Solucan Gübresi Kullanarak) Kategori-2
Üretim Kapasitesi	: Katı :312 Ton/Yıl Sıvı :480 Ton/Yıl
Depolama Kapasitesi	: 50 ton
Piyasaya arz şekli	: Ambalajlı (Katı 0.25, 0.5, 1, 5, 10, 20 kg Lamina Torba Sıvı 0.25, 0.5, 1, 5, 10, 20 lt plastik kap ve 1 Tonluk IBC Tank)
Çalışma İzni Veriliş Tarihi	: 13.03.2019
Çalışma İzin Numarası	: TR-06-OG-006
<p>13.06.2010 tarihli ve 27610 Sayılı Resmi Gazete'de yayımlanarak yürürlüğe giren 5996 Sayılı Veteriner Hizmetleri, Bitki Sağlığı, Gıda ve Yem Kanununun 6 ncı maddesine dayanılarak 24.12.2011 tarihli ve 28152 Sayılı Resmi Gazetede yayımlanan "İnsan Tüketimi Amacıyla Kullanılmayan Hayvansal Yan Ürünler Yönetmeliği" hükümleri kapsamında yukarıda ticari adı, adresi ve faaliyet alanı belirtilen tesise onay belgesi verilmesi uygun görülmüş olup, bu belgenin alınması diğer kamu kurum ve kuruluşları tarafından ilgili mevzuata göre verilen izin ve ruhsatların alınması mükellefiyetini ortadan kaldırmaz.</p>	
<p>Bülent KORKMAZ İL Müdürü</p> 	

Trademark Registration Certificate by Turkish Patent and Trademark Organization



T.C.
TÜRK PATENT ve MARKA KURUMU

MARKA TESCİL BELGESİ

Marka No : 2018 103431 - Ticaret - Hizmet

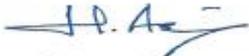


Marka Sahibi : SINIRLI SORUMLU KIRMIZI SOLUCAN GÜBRESİ ORTAK ÜRETİM VE PAZARLAMA KOOPERATİFİ
TÜRKİYE CUMHURİYETİ
Saray Mahallesi Yurt Caddesi No: 5 Kazan Ankara

Emtiası : 01 , 35
İlişiktir.



İşbu Marka 15/11/2018 tarihinden itibaren ON YIL süreyle
09/04/2019 tarihinde tescil edilmiştir.



Prof. Dr. Habip ASAN
Türk Patent ve Marka
Kurumu Başkanı

TÜRK PATENT
TÜRK PATENT VE MARKA KURUMU

Organic Products Registration Certificate by General Directorate of Plant Production of
Ministry of Agriculture And Forestry



T.C.
TARIM VE ORMAN BAKANLIĞI
Bitkisel Üretim Genel Müdürlüğü

ORGANİK ÜRÜNLER TESCİL BELGESİ

Firmanın	
Ticari Ünvanı	SINIRLI SORUMLU KIRMIZI SOLUCAN GÜBRESİ ORTAK ÜRETİM VE PAZARLAMA KOOPERATİFİ
Lisans Türü(Üretici veya Üretici(İthalatçı))	Üretici
Lisans No	1781
Ürünün	
Türü	ORGANİK ÜRÜNLER
Tip İsmi	Solucan Gübresi
Cinsi	Katı
Verilen Tescil No	12233
Marka veya Ticari Adı(varsa)	Koop's Katı
Ambalaj Üzerindeki İşaretleme	
Firmanın Ticari Ünvanı veya Kısa Adı	SINIRLI SORUMLU KIRMIZI SOLUCAN GÜBRESİ ORTAK ÜRETİM VE PAZARLAMA KOOPERATİFİ
Tip İsmi	Solucan Gübresi
Üretildiği Ülke (Türkiye Veya İthalat)	Türkiye
Beyan edilen özellikler	
Organik Madde %	45
Organik Azot %	1
Toplam Azot %	2,5
Maksimum Nem %	35
Maksimum EC (dS/m)	3
C/N	8,4
pH	6-8
Toplam Humik Asit + Fulvik Asit %	20
Ürünün garanti edilen net ağırlıkları veya hacimleri	0,25-0,5-1-1,5-2-2,5-3-3,5-4-4,5-5-10-20-50 Kg
Diğer İşaretler	Çocuklardan Uzak Tutunuz, Diğer Güvenlik Tedbirleri
Veriliş Nedeni	İlk Defa
Bu belge 16/05/2019 tarihinden itibaren 5 yıl için geçerlidir.	

23.02.2018 Tarihli ve 30341 Sayılı Resmî Gazete'de yayımlanan "Tarımda Kullanılan Organik, Mineral ve Mikrobiyal Kaynaklı Gübrelere Dair Yönetmelik"

Tarih: 16/05/2019


Ayhan GÜNERİ
Genel Müdür a.
Daire Başkanı V.

Organic Products Registration Certificate by General Directorate of Plant Production of Ministry of Agriculture And Forestry



T.C.
TARIM VE ORMAN BAKANLIĞI
Bitkisel Üretim Genel Müdürlüğü

ORGANİK ÜRÜNLER TESCİL BELGESİ

Firmanın	
Ticari Ünvanı	SINIRLI SORUMLU KIRMIZI SOLUCAN GÜBRESİ ORTAK ÜRETİM VE PAZARLAMA KOOPERATİFİ
Lisans Türü(Üretici veya Üretici(İthalatçı))	Üretici
Lisans No	1781
Ürünün	
Türü	ORGANİK ÜRÜNLER
Tip İsmi	Sıvı Solucan Gübresi
Cinsi	Sıvı
Verilen Tescil No	12234
Marka veya Ticari Adı(varsa)	Koop's Sıvı
Ambalaj Üzerindeki İşaretlemeler	
Firmanın Ticari Ünvanı veya Kısa Adı	SINIRLI SORUMLU KIRMIZI SOLUCAN GÜBRESİ ORTAK ÜRETİM VE PAZARLAMA KOOPERATİFİ
Tip İsmi	Sıvı Solucan Gübresi
Üretildiği Ülke (Türkiye Veya İthalat)	Türkiye
Beyan edilen özellikler	
Organik Madde %	12
Organik Azot %	1,13
Toplam Azot %	1,15
pH	7-9
Maksimum EC (dS/m)	5 dS/m
Ürünün garanti edilen net ağırlıkları veya hacimleri	0,25-0,5-1-2-5-10-20-30-50 Lt
Diğer İşaretler	Çocuklardan Uzak Tutunuz, Diğer Güvenlik Tedbirleri
Veriliş Nedeni	İlk Defa
Bu belge 16/05/2019 tarihinden itibaren 5 yıl için geçerlidir.	

23.02.2018 Tarihli ve 30341 Sayılı Resmi Gazete'de yayımlanan "Tarımda Kullanılan Organik, Mineral ve Mikrobiyal Kaynaklı Gübrelere Dair Yönetmelik"

Tarih: 16/05/2019


Ayhan GÜNERİ
Genel Müdür a.
Daire Başkanı V.

License certificate by General Directorate of Plant Production of Ministry of Agriculture And Forestry



T.C.
TARIM VE ORMAN BAKANLIĞI
Bitkisel Üretim Genel Müdürlüğü

LİSANS BELGESİ

Firmanın	
Ticari Ünvanı	SINIRLI SORUMLU KIRMIZI SOLUCAN GÜBRESİ ORTAK ÜRETİM VE PAZARLAMA KOOPERATİFİ
Lisans Türü	Üretici
Lisans No	1781
Merkez Adresi	Saray Mah. Yurt Cad. No:5 Kahramankazan / ANKARA
Telefon Numarası	05382007384-08503052320
Fax Numarası	-
Vergi Dairesi	Kahramankazan
Vergi Numarası	5580707488
Üretici ise, üretim tesislerinin adresi	1 - Saray Mah. Yurt Cad. No:5 Kahramankazan / ANKARA
Fason Üretimlerde Fason Üreticinin Adı ve Üretim Tesisi Adresi	-
Veriliş Nedeni	İlk Defa
Bu belge 16/05/2019 tarihinden itibaren 5 yıl geçerlidir.	

Bu belge Tarımda Kullanılan Organik, Mineral ve Mikrobiyal Kaynaklı Gübrelere Dair Yönetmelik kapsamında düzenlenmiştir.

Tarih: 16/05/2019


Ayhan GÜNERİ
Genel Müdür a.
Daire Başkanı V.

OUR PRODUCTS

koop SOLUCAN
GÜBRESİ
KOOPERATİFİ

“Yüksek Verim
Yüksek Kazanç”

Her Türlü Sebze,
Meyve, Tarla, Sera,
Bahçe ve Süs Bitkileri İçin
Toprakdan ve Yaprakdan
Kullanıma Uygunur.

Lisans No:1781
Tescil No:12234

ACHIEVE more yield
ADVANCE root growth
ADJUST soil's pH

0850 305 23 20
www.solucangubresikooperatifi.com.tr

S. S. HORMELİ SOLUCAN GÜBRESİ KOOPERATİFİ

As **Red Worm Fertilizer Cooperative**, we are aware that preventing inefficiency in agricultural production, which is one of the most important problems for our country, depends on the use of correct and effective fertilizing products and application of these products with conscious methods. However, the fact that our farmers obtain a large part of their fertilizer needs from the products coming from abroad and the inability of the domestic fertilizer producers to provide sufficient products reveals an externally dependent production model in agricultural production. Motivated by this unsustainable negative situation, we have developed **KOOP'S® Organic Worm Fertilizer** to provide added value to our country and farmers as a result of our long-term research and development activities.

We realize our production in our new facilities with hygienic conditions by using the latest technological equipments and with the devotion of our expert staff. With our high production capacity, we aim to meet the need of organic fertilizers in our country and to raise the awareness of our farmers by providing them efficient fertilizer use.

In our facility, **KOOP'S® Worm Fertilizer**, obtained by passing organic wastes through natural fermentation process and worm digestion system, is the only product that has the characteristics of chemical fertilizer having many different properties on the market. This natural production process begins by collecting organic wastes and fermenting them in a special system, and ends after the digestion process is completed by worms. The resulting mixture is blended into the final product.

The high rate of organic matter produced by **KOOP'S® Worm Manure** is able to fulfill the functions of many fertilizers currently used by our farmers, making it easier to use the product, while at the same time improving the soil, it makes it easier to obtain more productive results from agricultural lands.

Main features of KOOP'S Liquid Worm Manure;

- Increases plant yield.
- Improves the physical, chemical and biological structure of the soil.
- Increases the nutrient uptake of the plant.
- Helps root development.

INGREDIENTS	QUANTITY
Microbial Density	10 ⁸
Total Organic Substance	%12,0
Organic Nitrogen	%1,13
Total Nitrogen	%1,15
pH	7-9

It is an ecological product that naturally contains elements, amino acids, vitamins, microorganisms, antibiotics that provide plant nutrition and strength. The microorganisms contained in the soil nutrients in the form of the plant will take, facilitates the absorption by

the plant. This ensures maximum growth of the plants and avoids unnecessary fertilizer use. After the application of the manure, the growth of the plants is accelerated, the immune system develops, the product quantity and quality increases and the shelf life is extended. Does not exploit the land; on the contrary heals. It is the concentrated liquid (extract) form of worm manure.

HOW TO USE;

It is recommended to be used as root fertilizer. It is recommended to dilute 1 lt of liquid fertilizer with 100 lt of water and add to drip system or irrigation water. 100 lt mixture is enough for 4 to 7 decares of land according to plant type. The water used to dilute the product should not be chlorinated and the product should not be mixed with other chemicals, pesticides or disinfectants. It is recommended to shake well before use.

In the field crops during the vegetation period (10 days after planting) and 20 days after the first application, in the trees according to the type of product awakening, in the first shoot, a certain time before the flower and a certain time after flowering, 2 or 3 times It is recommended to apply at least twice with an interval of 15-20 days. In addition, it can be used at any time from field preparation to crop harvesting. Excessive use of manure has no harm to plants or soil, no toxic effects to the atmosphere and groundwater, no residue.

STORAGE:

The product should be stored at room temperature and away from direct sunlight. T. C. It was produced and put on the market with the production license numbered 1781 and registration certificate numbered 12234 of the Ministry of Food, Agriculture and Livestock.

BRAND NAME:

KOOP'S LIQUID WORM FERTILIZER

A- IMPORTANCE OF VERMICOMPOST (WORMS FERTILIZER)

As the world's population increases day by day, it becomes more difficult to meet people's nutritional needs. Fertilizer use has become a necessity in order to benefit more from crop production and make soil fertility sustainable. Fertilizers are divided into two as organic and inorganic fertilizers due to their different effects on soil and plants. Organic fertilizers are naturally produced fertilizers produced without interfering with any chemical substances. Organic fertilizers improve the physical, chemical and biological properties of the soil, increase the water holding capacity of the soil, accelerate the microbial activity, provide the aeration and clustering of the soil, and increase the yield and quality of the soil. Inorganic fertilizers, on the other hand, are fertilizers that are produced in fertilizer factories, which have chemical properties and which provide higher quality and more products from the unit area instead of soil health. However, with the intensive use of chemical fertilizers, soil quality decreases, pathogen resistance increases and adversely affects the environment and human health. As a result, there is concern about the sustainability of natural resources through the use of chemical fertilizers.

All of these; leading scientists to effective organic products that can be used as biological fertilizers and pesticides. The first searches in this field have focused on aerobic (thermophilic) compost products that have been used for centuries in soil improvement to increase soil organic matter content. The recognition of aerobic compost products as well as plant suppression effect of soil-borne plant pathogens led to the intensive study of these products in organic agriculture applications.

DIFFERENCES BETWEEN VERMIKOMPOST (WORMS MANURE) and CHEMICAL FERTILIZER

CRITERION	CHEMICAL FERTILIZERS	VERMIKOMPOST (worms fertilizer)
Enzyme Nourishing Content	They often contain an element (For example, urea contains nitrogen) or contain maximum two elements. (For example DAP contains nitrogen and phosphorus) It is not possible to find all the necessary nutrients in one chemical fertilizer.	Contains sufficient Nitrogen(N), Phosphorus(P) and Potassium(K) for plants. In terms of NPK, a plant has as much content as may be needed.
Secondary Nourishing Content	Not contains	Contains sufficient amounts of Calcium (Ca), Magnesium (Mg) & Sulfur (S) for the plant.
Tertiary Nourishing Content	Not contains	Contains sufficient amounts of Zinc (Zn), Boron (B), Manganese (Mn) for the plant.
pH Rati	Each time it is used, it increases the salinity and alkalinity by disturbing the soil's Ph balance.	Helps maintain soil Ph balance and provides control of salinization and alkalinity.
EC Verification	Plant nutrition leads to assimilation by creating EC imbalance in soil.	Helps to balance EC in the soil and increases the nutritional adaptation of the plant.

Organic Carbon	Not contains	Increases soil characteristics by containing very high amount of organic carbon and humus.
Water holding capacity	Reduces the water holding capacity of the soil.	Increases the water holding capacity of the soil.
Soil Texture	Disrupts the texture of the soil and causes it to lose its aeration property.	Enhances soil texture and reinforces ventilation.
Useful Bacteria and Fungi	Reduces productivity each time by eliminating biological activation. And it requires using more quantities for the next planting, leaving a weaker soil behind each time.	Contains very high biological activation; therefore less fertilization be required in each crop after regular use.
Growth Hormone for Plant	Not contains	Helps grow and produce products with enough natural hormones.

The second factor in the rapid spread of composting practices in the 1980s is that the compost is an economic, sustainable and environmentally friendly alternative to urban waste and waste treatment, which has become an important environmental problem in parallel with the level of urbanization. In studies on compost, it has been observed that the worm (mesophilic) compost method has superior properties in terms of both process and product recovery in aerobic compost recovery in urban and industrial organic waste. The production of vermicompost requires much shorter time than thermophilic compost. In terms of product quality, vermicompost products are physically, chemically and biologically superior to thermophilic (hot-loving) compost products and have economic value.

In the process of spreading the approaches that emphasize the concept of sustainability in agricultural production all over the world and encouraging organic production methods, the capacity of earthworms to convert organic waste and residues into a high quality valuable product in a short time was understood and European countries, India and America have led to the emergence of a new agricultural production sector called vermiculture. Vermicompost is a type of biotechnological compost created with a certain type of worm to accelerate the waste conversion process and achieve a better end product. The aim is to make use of the organic fertilizer released by the worms as they digest the organic matter in the compost.

Vermicompost is the composting process carried out by worms. The power in composting all organic wastes is beneficial bacteria. Worms accelerate the process by simply adding high octane value to the mixture. The worms mix and blend compost, microorganisms and nutrients during digestion, making them a small and perfect soil conditioner. The resulting worm droppings are left in the soil as organic fertilizer. The term vermicompost is generally referred to as vermicom (worm feces), although the term vermicompost is used for the product resulting from the composting of organic waste, where worms are used.

Today, Vermikompost is the highest economic benefit among the methods that support sustainability in agriculture, but it is also applied intensively in the processing of solid organic wastes and residues that have become a major environmental problem with rapid industrial development and population growth. The vermicompost technique, which provides high value products both commercially and ecologically, is applied extensively all over the world.

One of the main advantages of vermicompost is that it can be added to all kinds of agricultural soil as enriching and yield enhancing organic matter, it can be used for re-fertilization of inefficient agricultural lands exposed to excessive erosion and it can be used for recycling of organic wastes. During the process of composting the organic waste / residues to the worms, the organic waste / residues are fermented by the microorganisms in the environment and then subjected to an accelerated humification and detoxification process as the compost worms pass through the digestive system. The application of organic wastes to the soil at the end of both standard composting processes performed under aerobic and anaerobic conditions and composting processes using worms, all biological properties of the soil are regulated to a great extent. Vermicompost is produced by biological degradation of organic materials through the interaction of worms and microorganisms. Vermicompost contains nitrate, phosphate, exchangeable calcium and soluble potassium. It also contains plant growth hormones secreted by microorganisms. While worms are eating organic wastes, consuming bacteria, harmful nematodes, weed seeds and pathogenic fungi. The digestive system of worms destroys most of the bacteria and other harmful substances. The substances secreted by digestive wastes disrupt the structure of the pests in the environment and enable them to be consumed more quickly by other microorganisms.

B- WORKS RELATED TO VERMICOMPOST

Earthworms have been present in nature for more than 20 million years, during which time they fully fulfill their duty to keep their life cycles moving. The aims of these creatures are simple but important. Worms are the natural way of supplying organic waste from dead wastes to living organisms. This valuable function of worms has been proven many times by research. Vermicompost acts as a significant soil regulator and improver. As it is applied, it helps the total development of agricultural land and soil quality.

Vermicompost, NPK (Nitrogen(N), Phosphorus(P) and Potassium(K)) microelements, useful soil microorganisms, mycorrhizal fungi and especially nutrient organic fertilizers rich in plant growth regulators and preservatives. It was determined that the NPK value of vermicompost was 3-4 times higher than the raw material to which the worms were initially fed. In addition, it has been determined that the amount of micro element increases.

Vermicompost has high porosity, aeration, drainage and water holding capacity. Vermikompost has a large surface area for strong absorbability and nutrient retention. Therefore, it keeps the nutrients in the environment longer.

Vermicomposts have a large number and species of microorganism populations (Edward 1993, 2004). When added to soil, a significant increase in the number of native microorganisms is achieved, activity and diversity increases. Some microorganisms may have a synergistic relationship with plant rhizosphere and increase root extension. With the increase of root extension, access to deeper water and nutrients is provided. Some by-products of microbial origin promote plant growth, reduce antagonistic effects, and produce hormones and humates that affect plant growth. Some microorganisms, such as *Pseudomonas*, have antagonistic relationships with plant pathogens, and this microbial competition helps the plant to resist disease.

Vermicomposts have excellent physical and biological properties, making them the perfect compost for greenhouse materials, organic fertilizers and soil additives.

According to some research results; worm manure provides excellent ventilation, structure, porosity, drainage and water retention capacity. Worm manure can hold water up to 9 times its own weight. Worms are a natural soil tillage, digging their environment for forming worm manure. In addition, it was determined that worm manure contains two times more macro and micro elements than garden compost. Vermicomposts are known to contain sufficient amounts of macro nutrients and various trace elements. As a result of chemical analysis; vermicompost was found to contain lower pH, EC, organic C, C:N ratio, potassium, phosphorus and micronutrients compared to the main compost materials. After the application of vermicompost on agricultural soils, the amount of micronutrients increased significantly compared to those applied to manure. The amount of nitrogen in the soil increased significantly after vermicompost application to the soil. Similarly, useful P, K amounts increased.

The use of vermicompost increases growth, flowering and yield in vegetables and ornamental plants. Vermicompost application of 2.5 to 5 tons per acre in the fields provides significant plant growth and high quality fruit and vegetable yields. The effects of vermicompost in plants should not be attributed to the fact that they are only mineral nutrients. Because vermicomposts are also a source of plant growth hormones and humic acid. Moreover, vermicompost improves soil quality because it increases microbial biomass and activity, that is, it increases the activity and growth of microorganisms that play a key role in plant nutrient conversion, produce plant regulators and defend plants against arthropods.

C- VERMICOMPOST (WORM FERTILIZER) USAGE AND ITS RESULTS IN THE WORLD

The application of vermicompost made from grape residues in Australia as thin mulch to the seedling base of the grape increased the production amount by 20-50% during the first harvest.

In India, tea production increased by 75% to 240% as a result of the burial of worms among tea plants with organic matter.

In countries such as the United States, Japan and Czechia, vermicompost application is 15-20% in wheat; 30-50% in corn; 15-20% in beets; 50-80% in potato, 20-30% in pepper, tomato and cucumber; 80-100% in peaches and grapes; 30-35% increase in yield of strawberries.

In a study conducted with red radish, it was observed that the amount of yield in the plant increased with increasing vermicompost application. The growth rate of red radish grown with 100% vermicompost applied was 10 times that grown with 10% vermicompost (Buckerfield et al. 1999).

In another experiment on red radish, it was determined that vermicompost initially inhibited sprouting, then increased plant growth with diluted extract applications and increased red radish harvest by 20%. The large amount of vermicompost prevents growth due to its high electrical conductivity (salt content) and excessive nutrient content.

When vermicompost not applied and applied experiments are compared; Soil analysis results after vermicompost application, showed that vermicompost improves physical and biochemical properties of soil.

As a result of the researches, 100 % of inorganic fertilizer vermicompost applied to 10 tons per acre and determined that the growth of mulberry is accelerated. The addition of inorganic fertilizer to vermicompost applications was made to equalize the N level of the soil.

The amount of tomato product obtained from fields using vermicompost and inorganic fertilizers has always been higher than those used only commercial fertilizers (Aracon et al. 2004). Adding vermicompost to field soil mixed with 50% inorganic fertilizer increased tomato production. The remaining productivity in the soil fertilized with 50% inorganic fertilizer and 50% vermicompost in the previous year increased wheat production.

When 75% inorganic fertilizer soil mixture was used together with 2.5 tons /acre vermicompost, yielded much more potatoes. (Mrinal et al. 1998). According to the researchers, vermicompost is a large number of beneficial microorganisms in the finished product that make fertilizer so effective.

Vermicompost is a fertilizer that is slowly released and protects the plant against disease and pesticides. With the continuous application of vermicompost, a constant proportion of organic nitrogen and other nutrients from accumulated humus also tend to be released into the environment, and NPK (Nitrogen(N), Phosphorus(P) and Potassium(K)) nets overall efficiency is 50% better than chemical fertilizers.

Vermicompost acts as a remedy for healing soil contaminated with chemicals. With the use of vermicompost, the dangers of agrochemicals can be significantly reduced and used in place of agrochemicals. Provides control of pesticides and diseases while reducing the need for irrigation, thus providing farmers, economy and ecological benefits with vermicompost. These functions of vermicompost become more effective with mulching. Mulch keeps the environment moist and accelerates the conversion of worm cocoons (worm eggs) into juvenile worms.

It was observed that the plants grown in vermicompost applied soils were more resistant to diseases and pests. The antibacterial and antifungal effect of vermicompost on plants is mainly due to solomic fluid, which worms secrete out of their bodies for various reasons. Enzymes and proteins such as agglutinin, fetidine, lumbricidine and chitinase are present in the structure of the solom fluid which is mixed with the vermicompost due to their environment for months; some fungi, bacteria and chitin in the structure shows the effect against pests, thus weakening the negative effects of many diseases and pests.

Organic materials composted by soil worms, various liquids, enzymes, vitamins, proteins, coco, vermicompost is mixed with old and juvenile worms that die for various reasons (Prabha et al. 2007).

One of the important features of this structure is the inclusion of a large number of microorganisms living in the intestines of worms into the structure of vermicompost. Thus, it has been seen that with the improvement of the chemical and physical properties of the soils applied vermicompost, the total microorganism, nitrogen-binding bacteria and symbiotic mycorrhizas increase the number of soil pathogens and thus suppress the biological properties of the soils. Verticillum wilt suppression in strawberries, grape dusty mold and phomopsis diseases in the field studies on red radish and cucumber pythium and rhizoctonia diseases in laboratory studies have been shown to destroy the disease (Chaoui 2002).

D- ORGANIC FARMING IN TURKEY, THE IMPORTANCE OF VERMICOMPOST (WORM MANURE) IN ORGANIC AGRICULTURE

Mankind has realized that the damage level has reached maximum levels by ignoring the environment since the day it started its agricultural activities and tended to prefer organic production which is safer agriculture. Faced with the negative consequences of intensive chemical fertilizer and pharmaceutical consumption, it has started to seek its agricultural alternative production and started to take its share in this production. In the world, agricultural production shows an increasing tendency towards organic agricultural production by using organic inputs by keeping it away from chemical inputs. In some countries of the world and Turkey has started to use the concept of organic farming. However, this expression has started to manifest itself in different countries with expressions such as ecological agriculture and biological agriculture. However, the aim here is to be more sensitive to the environment and to produce in a completely natural input cycle away from chemical residues in the products.

According to 2017 data; The total area of organic agriculture production in the world is 50.9 million acres. The organic market size in 2015 is estimated to reach 81.6 billion euros. In total, 2.4 million producers in 179 countries operate in the organic agriculture sector. More than 84% of organic farming producers are in Asia, Africa and South America. In Turkey, the number of organic producers in the year 2015 (69.967) is the world's number 8 among the top 10 countries in terms. It ranks first in Europe.

Countries with the most organic agricultural producers are India, Ethiopia, Mexico, Uganda, the Philippines and Tanzania, respectively. While agricultural activities using chemical inputs continue in our country, production has increased significantly in recent years. In 2014, the organic agricultural production area was 842.216 ha and 1.642.35 tons of production, while this rate decreased to 523.778 acres in 2016, but the amount of products produced increased to 2,473,600 tons. In 2016, there were 225 crops and 67,878 farmers in the field of organic agriculture.

ORGANIC AGRICULTURAL PRODUCTION DATA (Including Transition Process)

YEARS	NO OF PRODUCTS	NO OF FARMERS	PLANTED AREA (ACRE)	NATURAL COLLECTION AREA (ACRE)	TOTAL PLANTED AREA (ACRE)	AMOUNT OF PRODUCTION (TONS)
2003	179	14.798	73.368	40.253	113.621	323.981
2004	174	12.751	108.598	100.975	209.573	377.616
2005	205	14.401	93.134	110.677	203.811	421.934
2006	203	14.256	100.275	92.514	192.789	458.095
2007	201	16.276	124.263	50.020	174.283	568.128
2008	247	14.926	109.387	57.496	166.883	530.224
2009	212	35.565	325.831	175.810	501.641	983.715
2010	216	42.097	383.782	126.251	510.033	1.343.737
2011	225	42.460	442.581	172.037	614.618	1.659.543
2012	204	54.635	523.627	179.282	702.909	1.750.127
2013	213	60.797	461.395	307.619	769.014	1.620.387
2014	208	71.472	491.977	350.239	842.216	1.642.235
2015	197	69.967	486.069	29.199	515.268	1.829.291
2016	225	67.878	489.671	34.106	523.778	2.473.600

Some of the products produced by organic agriculture in Turkey is carried out as gardens and agricultural fields. The other part consists of products collected from natural environments.

In developed and developing countries, there has been a tendency towards organic agriculture due to the demand for environmentally friendly and healthy agricultural products, far from chemical inputs. This increase has begun to show itself as felt in Turkey. Increasing demand and making investments in organic agriculture, activities such as supervision and certification have been accelerated by the related institutions and the ground for safer food to reach the table has been prepared in this regard. The point that attracts producers in the activities aimed at organic agriculture is the high demand for organic agricultural products and the results that will satisfy the producer satisfactorily in sales costs.

While such a situation is observed for organic agriculture production activities in Turkey by 2014 and significant increases in market share and consequently the rate of demand.

According to the academic and scientific research conducted in India (Sinha and Herat; 2012), interviews were conducted with some farmers in India and interviews with farmers were the subject of the researches. Farmers in India use Vermicompost as a result of positive responses by farmers, contribution to the economy (sale of worms and vermicompost) and positive contributions to the environment (improvement of the biological, physical and chemical properties of the soil), the use of chemical fertilizers is fully exported and pushed to the background. Therefore, many of the farmers have suggested that organic farming has changed completely, and some have suggested that crops can be harvested 3 times a year (rapid growth and shortening of harvest time). Many villages in India are called as BIOLOGICAL-

VILLAGE because of using only vermicompost in plant production and giving up chemical fertilizers completely.

The responses of farmers in India using vermicomposts are as follows;

- The use of irrigation water has decreased and with the use of vermicompost for years, the soil's water-holding capacity has improved.
- Vermicompost treated products reduced pesticide attacks (at least 75%)
- The remnants of the cauliflower plant grown with vermicompost have been destroyed by 95%.
- Fungal disease in banana decreased by over 95%.
- Compared with vermicompost chemical fertilizer, the number of fruits per plant was higher in vegetables and the seed per spike in cereal crops was higher, both heavier and better in terms of quantity and quality.
- Wheat production increased from 35% to 40%.
- The termite effect is reduced, especially in places where the worm population is high.
- Weed level decreased.
- Dried grass (animal feed / straw) increased by about 50%.
- 30-50% increase in commercial floriculture.
- The flowers have broader leaves and more colorful.
- Germination and trunk development occurred faster.
- Although fruit and vegetables are more viscous and delicious, the storage period without spoiling is 2-3 days in chemical fertilizer and this time in vermicompost increases to 6-7 days.

Comparing with the answers, hesitations regarding the application of Vermicompost (Worm Manure) were largely eliminated and farmers were encouraged to apply Vermicompost.

With the increasing demand for organic agricultural products and the lack of balance in supply and demand in the domestic market, the importation of organic agricultural products came on the agenda and in 2014, some organic agricultural products from nearly 25 countries were imported and consumed in the domestic market.

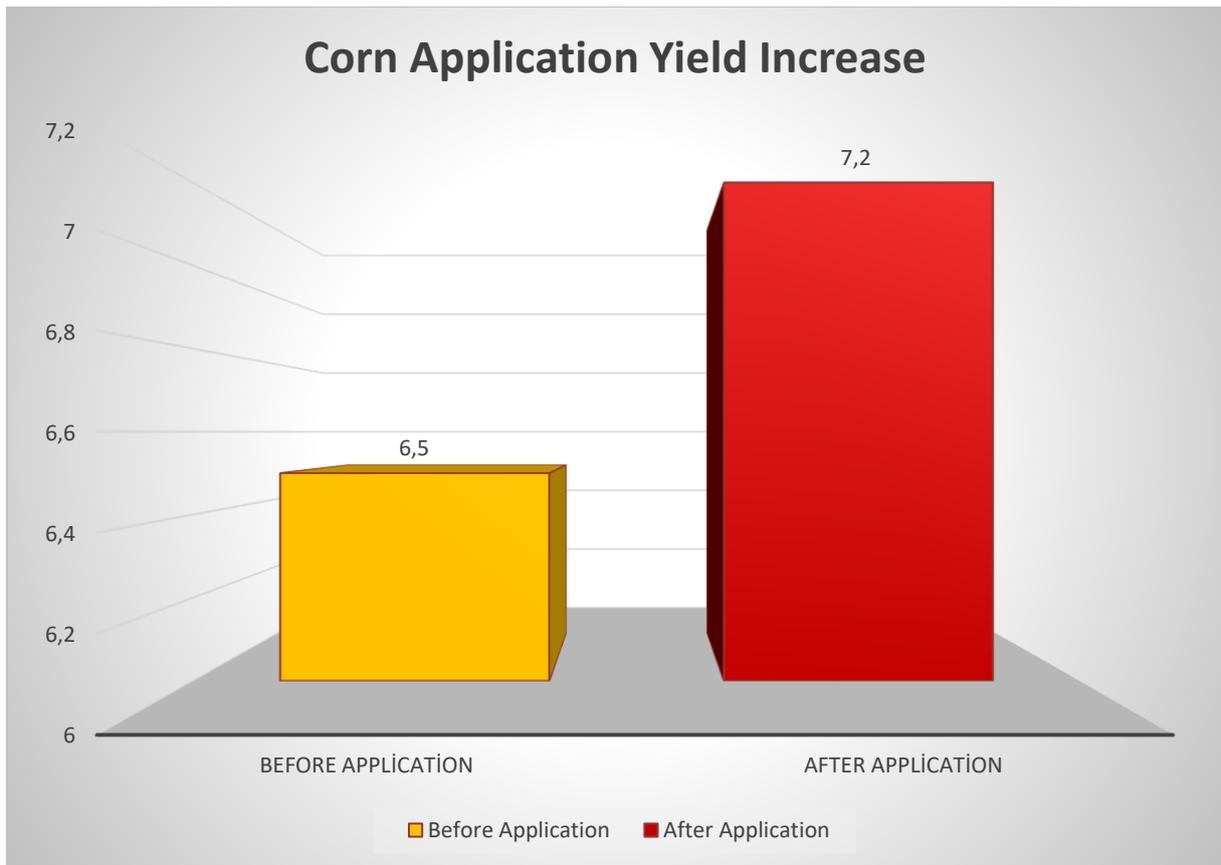
It is very important to take the necessary precautions since it is very difficult to restore the balance of nature which is deteriorated as a result of environmental pollution caused by unconscious use of chemical fertilizers. For this reason, the physiological characteristics of mineral fertilizers that will be used in agricultural applications, parameters such as plant and soil structure should be evaluated together and care should be taken to ensure that this application is sustainable. Or, it should be ensured that the awareness among the agricultural

inputs in vermicompost (worm manure), which is one of the alternatives of organic fertilizer usage and continues to be used in many countries of the world and whose usage areas are increasing day by day, should be given importance to farmer training studies on the benefits of organic fertilizers.

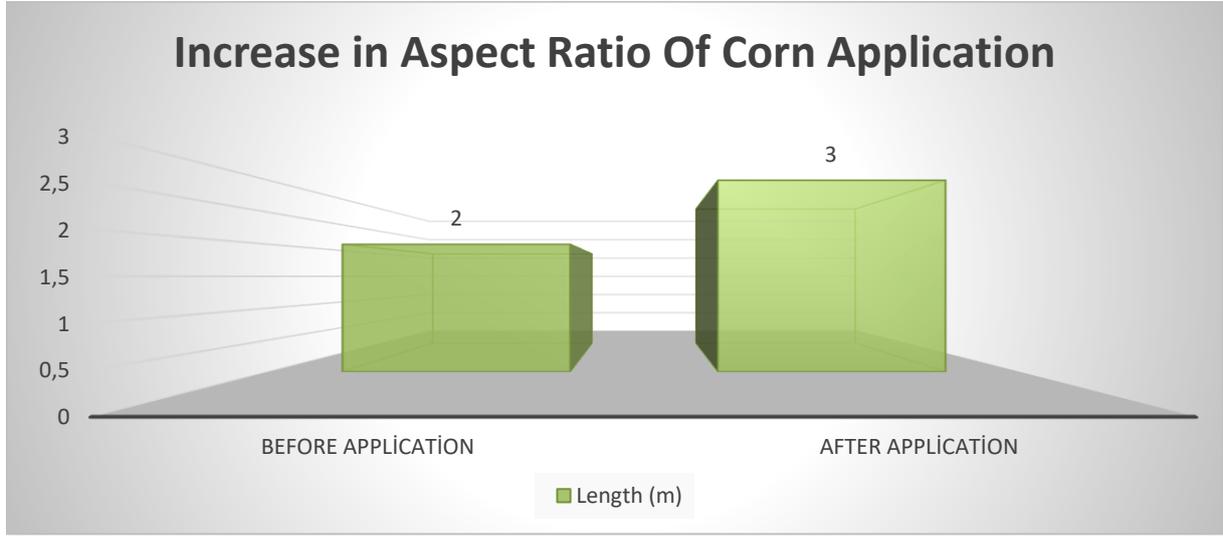
E- SOME OF OUR APPLICATIONS

CORN

Province	Product	Land size	Before Application Acre/ton	Length before Application meters	After Application Acre/ton	After Application meters
Karaman/Turkey	Corn	100 Acres	6.5	2.00	7.2	3.00

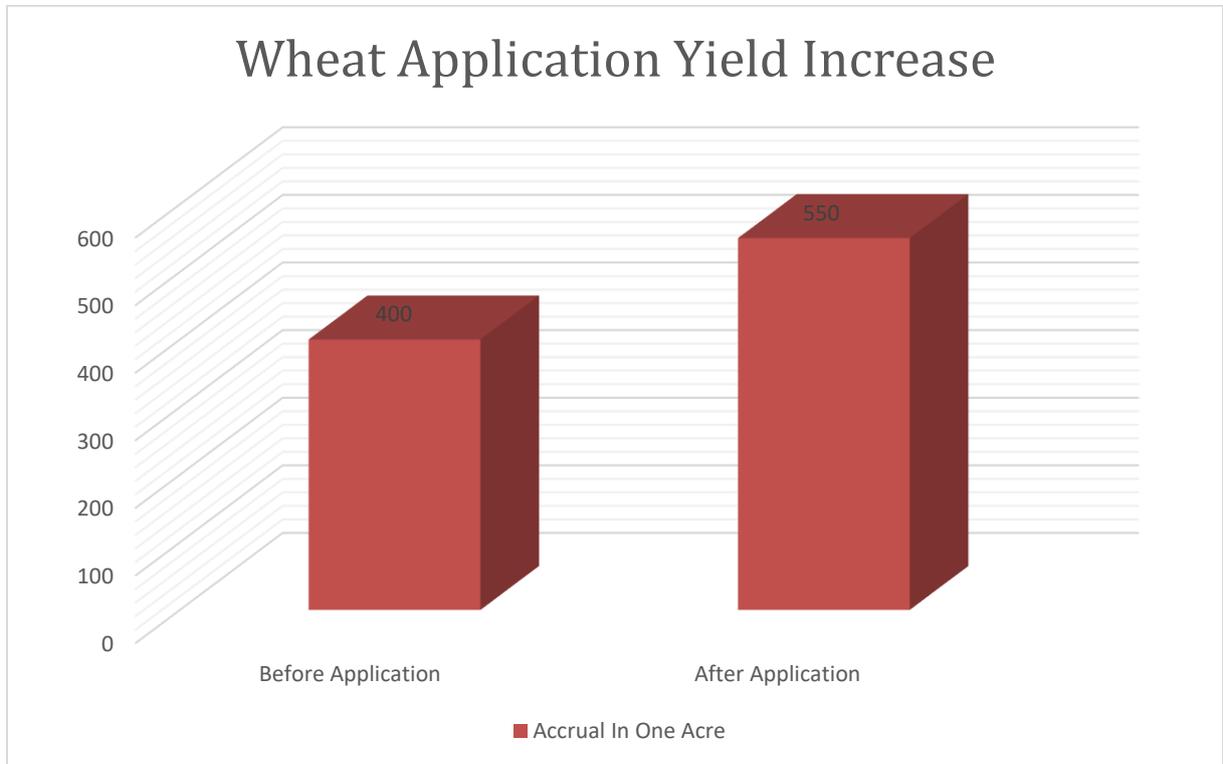


As a result of **KOOP'S® Liquid Worm Fertilizer** application on **Corn** in Karaman Province, approximately **10% yield and 50% height increase** was achieved.



WHEAT

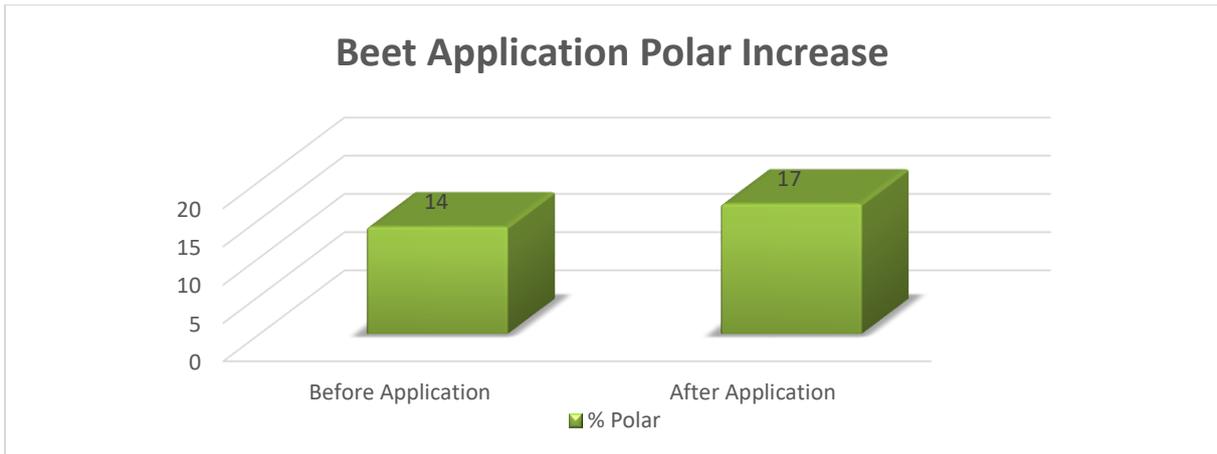
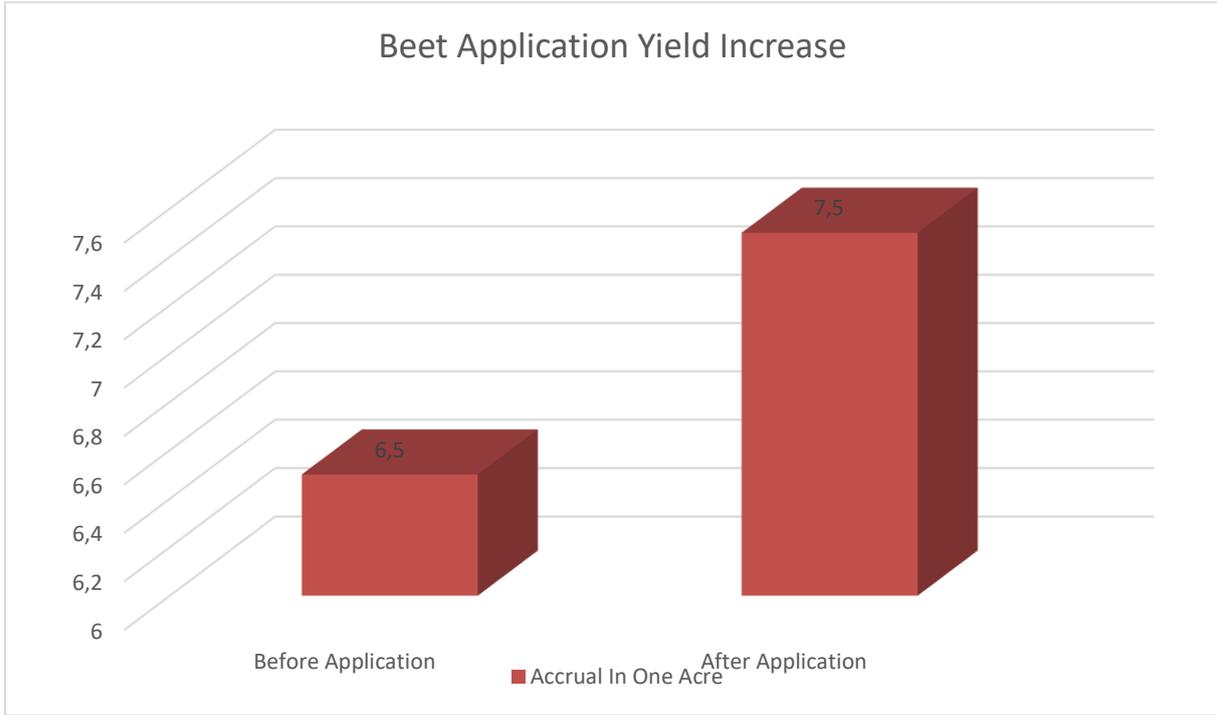
Province	Product	Land size	Before Application Acre/Kg	After Application Acre/Kg	Accrual %
Polatlı/Turkey	Wheat	100 Acres	400	550	37.5



As a result of the application of **KOOP'S® Liquid Worm Fertilizer** on **Wheat** in Polatlı District of Ankara, **37.5% yield increase** was achieved.

BEEET

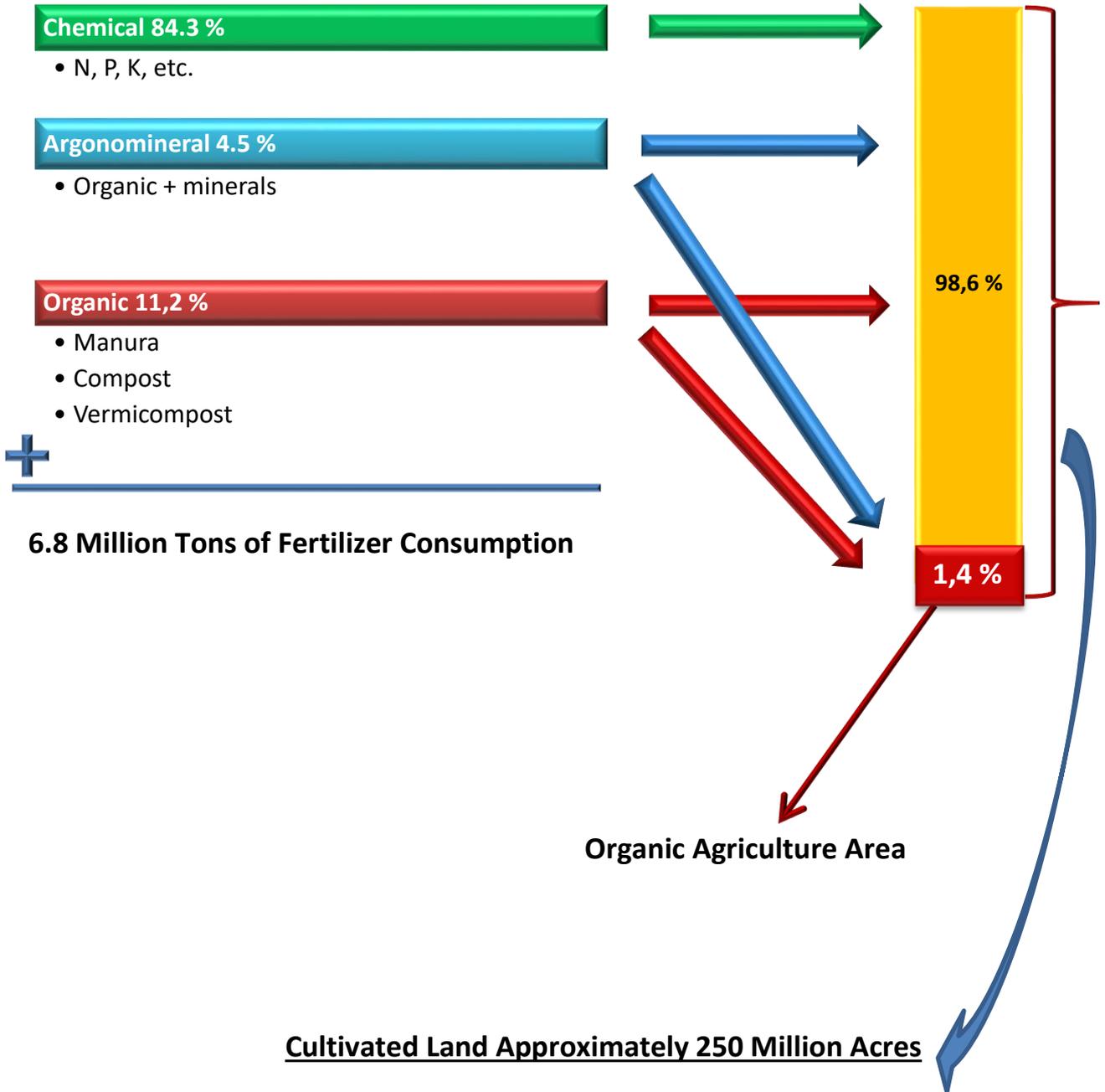
Province	Product	Land size	Before Application Acre/Ton	After Application Acre/Ton	Polar Ratio Before %	Polar Ratio After %
Polatlı/Turkey	Beet	60 Acres	6.5	7.5	14	17



Polar: Sugar Unit

As a result of **KOOP'S® Liquid Worm Fertilizer** application on **Beet** in Polatlı District of Ankara Province, the increase in **Polar ratio** was **21.5%** and the increase in beet yield was approximately **15%**.

F- PLANTED FIELD, FERTILIZER USE AND SOLUTION PROCESS IN OUR COUNTRY



Solution Process

What do we offer to our customers?

Chemical Fertilizers

When used together:

- Reduces negative effects
- Reduces need and cost
- Multiplies yield increase

Organominerals

- Less cost
- Higher organic matter, faster soil reclamation

Vermicompost

- Product's cost advantage
- Ease of application
- Fast oscillation resulting in fast yield
- Higher organic matter

G- FEEDBACK RESULTS OF OUR PRODUCT

Product Feedback Results

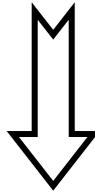
- Walnut Growing
 - Greenhouse Growing
 - Cereal Growing
- ↻ Product introduction
- ↻ Sample application 3 times with 20 days intervals on trees and seedlings without charge
- ↻ Productivity and Cost Advantage **KOOP'S® Liquid Worm Fertilizer** Positive Results over untreated trees

Interview Results

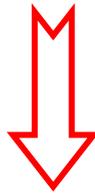
Rate of Sample Application as a result
of Product Promotion in Customer

Interviews 100 %

BASIC NEEDS



Sustainable agriculture for the construction of the future



Vermicompost (worm fertilizer) for sustainable agriculture

H- CONCLUSIONS AND RECOMMENDATIONS

Considering the studies on soil fertility in our country, there are not enough studies on the effects of worms on soil fertility. Therefore, those who are engaged in agriculture do not have sufficient knowledge and experience about the potential benefits of these organisms in all kinds of agricultural operations.

Vermicompost, which is an important factor both in maintaining nutrient balance in soil and increasing quantity and quality of agricultural products, has been known throughout the world for many years and its production and use is increasing day by day. In addition, many agricultural waste / residues existing in our country are either incinerated or disposed of because they are not evaluated under appropriate conditions. One of the best ways to evaluate agricultural waste/residues is to use these wastes in vermicompost construction. Since there are not many academic studies on the benefits, production and use of vermicompost in our country, the knowledge and experience of our producers on this subject has been limited. For this reason, it is very important to pay attention to the production, use and benefits of vermicompost.

Vermicompost (worm fertilizer), because it is an organic material, has the effect of improving soil properties, can be applied to all plants can be easily applied to all the nutrients. Soil analysis of the area to be produced can be done according to plant species.

Although it is known that the organic matter levels of the soil of our country are known, the existing wastes should be recycled and re-transformed into soils. The positive effects of worms are known in the evaluation of these wastes. Together with these positive effects, both the needs of the soil are met and waste / residues are evaluated. Given that nature protection should be the primary objective, **Worm Fertilizer** plays an important role and can make a significant contribution to the future of sustainable agriculture.