RHS-2-S

RIVO'S HARVESTING SYSTEMS

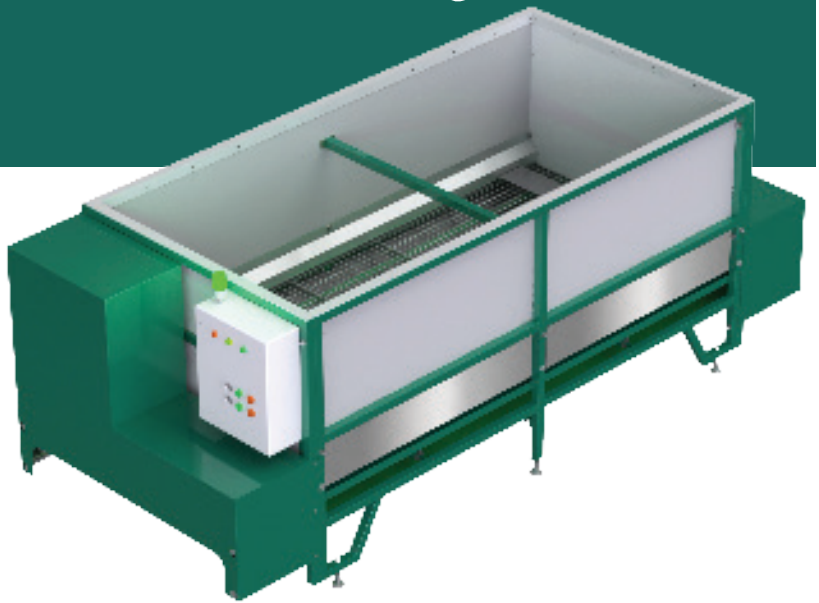
Rivo's Technics

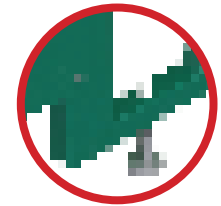
New Generation Vermicompost Harvesting Systems

RHS-X

RİVO'S VERMICOMPOST HARVESTING SYSTEM

18 months guarantee





TECHNICAL DETAILS AND STANDARD SPECIFICATIONS	
Producer	: Rivo's Technics
Model	: Rivo's Harvesting System (RHS-X)
Blade	: Laser cut (Chain-lifted monobloc)
Chain and Equipment	: Double-sided traction system with fertilizer isolation
Board Specifications	: Electronically controlled; digital temperature and moisture measurement; light and sound warning
Security	: Three emergency stop buttons
STRUCTURAL SPECIFICATIONS	
Skeleton	: Welded metal profile
Side Plates	: PPM plastic
Design	: 3D CAD-based modular; multiples of 2.5 m
Sizes Between Outer Sides (RHS-X/20)	: 13 m (w) x 20.9 m (l) x 1.2 m (h)
Colour	: RAL 6005 moss green
CAPACITY	
Suggested Initial Worm Capacity (RHS-X/20)	: 250,000
Full Worm Capacity (RHS-X/20)	: 1,000,000
Total Vermicompost Capacity (RHS-X/20)	: 18.5 cubic metres (±10%)
First Harvest	: Within 3 to 6 months
Monthly Vermicompost Capacity (RHS-X/20)	: 4.5-5 metric tonnes (moist)
OPTIONAL FITTINGS	
Conveyor Belt	: 41-m long (RHS-X/20), 2.5-mm thick rubber coating
Board Specifications	: Remote monitoring, remote control through computer and mobile phone, PLC touch screen, temperature and moisture control system

RHS-X

Proudly designed and produced by Riverm Ltd, RHS-X vermicompost harvesting systems are in use by about 30 vermicompost operations across Turkey.

The basic idea behind RHS-X harvesting systems is to add the worm food (a fermented mix of cow manure and various plant matter) on the top of the system, and harvest the vermicompost from the bottom which allows feeding and harvesting to be achieved simultaneously with no need to empty the whole vermicompost pile, unlike the in-ground compost heaps.

The standard inner width of each RHS-X harvesting system worm bed is 1.22 m, which translates to a width of 1.3 m between the outer sides. The standard height of the system is 1.3 m, while the inner depth of the worm beds is 0.74 m, which is elevated by legs resting on adjustable footings to offset any possible unevenness of the ground. The length is variable depending on the demand — Riverm Ltd is capable of producing harvesting systems 2.5 m to 22.5 m long, and plans are underway for systems as long as 50 m. On average, a 20-m long system settles on an area of 3 m x 22.5 m (which includes operational areas for feeding and harvesting surrounding the system). The sides of the system are made of PPM plastic sheets, while the structural skeleton consists of welded steel profile. The elevated system allows easier harvesting, maintanence, control, and better protection against rodents and other pests. Average monthly vermicompost harvest depends on the length on the system and varies between 500 kg and 6 metric tonnes (and multiple times of that for a 50-m long systems). The volume of a fully loaded 20-m long system is 18.5 cubic metres.

The standard equipment of the system includes a monoblock blade propelled by chains, an electronically controlled panel, digital temperature and humidity measurement, light and sound warning, and an emergency stop button. The standard colour is RAL 6005 moss green. Optionally, we can include remote monitoring and control (through computers and mobile phones), a touch screen, and temperature and humidity conditioning systems.

The operation principle of RHS-X harvesting systems is quite simple. The mix of cow manure and up to 30% plant material (includes anything from garden waste, weeds, tea and coffee grounds, a little bit of paper, to selected domestic waste — it is particularly important to leave acidic waste, such as orange peels, out — all shredded up for good before adding onto the pile) is fermented and frequently aerated for a couple months in an area separate from the worm beds. In the end, this mix turns out to be the worm food.

The bottom of a system is made of steel mats which allow the vermicompost to drop onto the conveyor belt below during the harvest. Before the first load of worm food is added to a newly-built system, the bottom is covered with easily biodegradable kraft paper, so there won't be any spills through in the beginning (once the worms munch through the feed and turn it into vermicompost, it attains an aggregated form, so there won't be any drops through the steel mat even after the kraft paper is biodegraded). One particular issue to keep in mind is the humidity level in worm food, since the worms cover their water needs by the humidity of the food. While this depends on the local climate of your planned vermicomposting facility, keeping the worm food humid is sometimes an issue in Turkey, where most of the time summers are dry. And by "humid," we mean more or less in the saturation level of a sponge, i.e., neither completely dry nor wet all the way.

So, you have added the first layer of food into the empty system, and then come the worms. The optimal population for a harvesting system is 40,000 individuals per square metre. For the start, though, Riverm Ltd advises to add 10,000 individuals per sq m. If everything is alright, and the conditions are ideal, the 40,000 threshold will be reached until the system is full, and then the excess population can be trapped and taken to another worm bed, or sold. These tiny creatures are a little epicurean, so to speak — too much population in a too tiny space lowers their vermicompost production levels.

The species we use for vermicomposting is red Californian worms (*Eisenia fetida*), native to the swamplands and humid soil of Europe. They are easy to adapt, quick to produce vermicompost, and have a high level of reproduction rate. The optimal temperature for them to vermicompost and reproduce is about 20 degrees C; above 40 degrees C and below +7 degrees C, they ground to a halt. Other species belonging to the *Eisenia* and *Dendrobaena* genera have been tried and found successful for producing vermicompost, though.

Once the first layer of food and worms are in the system, more food is added from the top, preferably weekly, but the frequency is mostly dependent on the operation plan and workforce. One easy hint to see whether the worms need more food is to inspect the top of the food heap frequently and closely — when the food is first added, it should look lumpy, cloddy, and coarse, like miniature craggy mountains. After the worms go through it, it should flatten down fairly well — think of a fully still ocean if that helps.

So, more layers of food are continuously added onto the top of the system; if the conditions are optimal, it can take as little as three months until the system is full, although a duration of four to six months is probably a more realistic expectation. This is when you get your first harvest. Again, the frequency of harvest depends on the operation plan and workforce; we have found out that weekly harvests are easy to carry out. By this time, the kraft paper is fully biodegraded into the vermicompost and is nowhere to be seen. A blade mounted into the system slowly works its way through the bottom part of the heap, and the fully mature vermicompost falls onto the conveyor below, which takes the harvested vermicompost to the front of the system. The harvest is then taken to drying which can be achived naturally, or with the help of a fan or other drying machinery.

And what happens to the worms when the blade goes through the bottom of the heap? Well, since the vast majority of them live only in the uppermost 10-15 cm of the bin, there is only a minimal amount of worms to be found in the harvest. By the way, since the worms are sensitive to light, keeping the lights on for 24 hours a day in where the systems are located is important, lest they escape from the top of the system and scatter all over the place.

So, adding the worm food on the top, letting the worms eat it up completely, and harvesting months-old, properly matured product from the bottom, ensures all of the harvest is vermicompost with no impurities, thanks to the ingenious and innovative design of RHS-X harvesting systems.

With plant nutrients, humic matter, natural enzymes, antibiotics and hormones present in it in a packed way, vermicompost is agriculturally a fairly balanced organic fertilizer. By "balanced," we mean it meets the needs of most plants in organic cultivation in a proper way with little likeliness of harming the plant even when used excessively (unlike, for example, some other organic fertilizers very high on nitrogen and phosphorus and lead to scorched plants easily when overused). And since all vermicompost goes through the digestive tract of the worms, it includes no weed seeds, plant diseases, and insects or their eggs, unlike, for example, fresh cow manure. Vermicompost also naturally includes coelomic fluid, which is excreted by worms as a protection of their body against external threats. Coelomic fluid is known to deter many plant diseases, and is particularly important in the utilization of vermicompost in organic agriculture, which does not allow chemical pesticides.

Riverm®

Technics

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