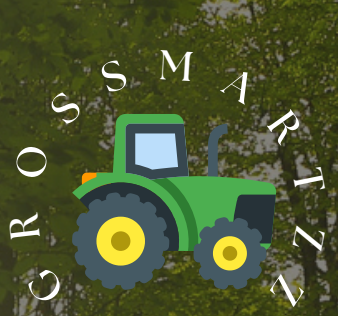
SRI SHANMUGHA
EDUCATIONAL INSTITUTIONS



SRI SHANMUGHA
COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

GROSSMARTZZ

GLIMPSE OF

2023-2024

DEPARTMENT OF AGRICULTURE ENGINEERING

Thiru. K.Shanmugham
CHAIRMAN
SRI SHANMUGHA EDUCATIONAL INSTITUTIONS

Dear Members of the Sri Shanmugha Educational Institutions,

I am delighted to announce the release of the inaugural edition of GROSSMARTZZ, a magazine brought to you by the Department of Agriculture Engineering. This publication encapsulates the essence of our institution's commitment to academic excellence and innovation in the field of biomedical engineering. Within its pages, you will find insightful articles, highlights of student achievements, and a retrospective on the myriad events that shaped our academic journey throughout the year 2021 - 2022. As Chairman, I extend my heartfelt congratulations to the editorial team and contributors for their dedication in bringing this vision to fruition. May Inventus serve as a beacon of inspiration and knowledge for years to come.

Warm regards,

THIRU.SHANMUGHAM K, Chairman,
Sri Shanmugha Educational Institutions

Thiru. A.Thirumoorthy

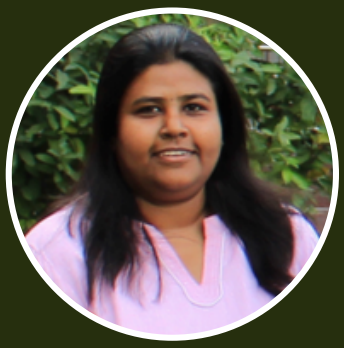
EXECUTIVE DIRECTOR
SRI SHANMUGHA EDUCATIONAL INSTITUTIONS

Dear GROSSMARTZZ Readers, As Executive Director,

I am thrilled to announce the launch of the first edition of GROSSMARTZZ from the the Department of Agriculture Engineering at Sri Shanmugha Educational Institutions. This publication encapsulates the pinnacle of academic prowess and innovation within our institution, offering a glimpse into the ground breaking research, student achievements, and enriching events that defined the year 2021 - 2022. My sincere gratitude goes to the editorial team and contributors for their dedication in crafting this informative and inspiring magazine.

Warm regards,

Mr. THIRUMOORTHY ARUMUGAM, Executive Director,
Sri Shanmugha Educational Institutions.



Mrs. GOKILA THIRUMOORTHY ARUMUGAM

JOINT SECRETARY SRI SHANMUGHA
EDUCATIONAL INSTITUTIONS

Dear GROSSMARTZZ Readers,

As Joint Secretary of Sri Shanmugha Educational Institutions,

I am pleased to announce the launch of the inaugural edition of GROSSMARTZZ, prestigious publication curated by the the Department of Agriculture Engineering. Within its pages lie stories of academic prowess, student achievements, and noteworthy events that shaped the fabric of our institution in the vibrant year of 2021 - 2022. This magazine stands as a testament to our unwavering commitment to fostering intellectual growth and scholarly exploration. Let us embrace this momentous occasion and look forward to the continued success of this esteemed publication.

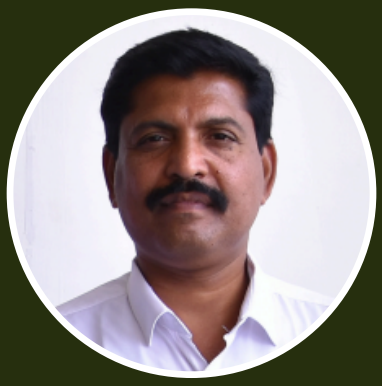
Warm regards,
Ms. GOKILA THIRUMOORTHY ARUMUGAM, Joint Secretary,
Sri Shanmugha Educational Institutions.

Dr. N. R. SRINIVASAN
ADVISOR
SRI SHANMUGHA EDUCATIONAL INSTITUTIONS

Dear Members of the SSEI,

In my role as Advisor to Sri Shanmugha Educational Institution, I am honored to introduce the inaugural edition of GROSSMARTZZ a testament to the excellence and ingenuity that defines our institution's commitment to the Department of Agriculture Engineering This magazine serves as a testament to the remarkable accomplishments of our students and the transformative impact of the events held throughout the academic year 2021 - 2022. My heartfelt congratulations go to the the Department of Agriculture Engineering for their dedication and hard work in bringing this publication to fruition.

Warm regards,
Dr. N. R. SRINIVASAN,
Advisor,
Sri Shanmugha Educational Institutions.



Dr. G. M. TAMILSELVAN

PRINCIPAL

SRI SHANMUGHA COLLEGE OF ENGINEERING AND TECHNOLOGY

Greetings,

I am pleased to introduce the inaugural edition of GROSSMARTZZ, a magazine crafted by the the Department of Agriculture Engineering. This publication encapsulates the remarkable achievements and milestones reached in the realm of biomedical engineering throughout the academic year 2021 - 2022. Within its pages, you will find insightful articles, student accomplishments, and a retrospective on the events that have shaped our academic journey. My sincere appreciation goes to the editorial team and contributors for their dedication and hard work in bringing this vision to life. GROSSMARTZZ serves as a testament to our institution's commitment to excellence and innovation in the field of the Department of Agriculture Engineering.

Warm regards,

Dr . G. M. TAMILSELVAN,

Principal,

Sri Shanmugha College of Engineering and Technology.

STUDENT OFFICIALS

Mr S R Karthick
PRESIDENT

Ms DHANUSHIYA
VICE PRESIDENT

Mr AKILAN KUMAR
SECRETARY

MR B GUNAL
TREASURER

Mr MASAN
OFFICE BEARER

ABOUT US

Considering the importance of conserving natural resources, proper land management and to provide quality education on agriculture to the rural masses, the department of Agriculture Engineering was established in the year 2016 with an intake of 60. Sri Shanmugha vows to promote agriculture by bridging the gap between agriculture and latest technology. Our primary motive for offering this course is to serve the farming community by inculcating the effective utilization of available resources with the motto: "Resources are limited but creativity is unlimited'. Sri Shanmugha provides state-of-the-art agricultural practices to the farmers and the society at large, 'for a better and a greener tomorrow'.

The Department has been maintaining high standards in informing superiority education in the challenging field of Agriculture. Highly experienced and dedicated faculty members with\ minimum M.E / M.Tech / M.Sc qualification impart quality training to students, with solid emphasis on understanding the fundamentals and intricacies of the subjects concerned and subsequently apply them to solve problems. The Department has successfully conducted Technical Symposiums and has arranged a number of seminars and several invited lectures by eminent persons both from academia and industry. The Department has well established lab facilities with well- equipped farm land suited to the syllabus prescribed by the University.

VISION

- To produce Agricultural Engineers with enriched knowledge and moral values to achieve excellence in academic, industry and research-centric environments.

MISSION

- M1: To provide a conducive learning atmosphere to improve the analytical, design and investigation knowledge through effective teaching-learning Processes
- M2: To create an amicable environment to solve societal problems through continuing education programmes and research
- M3: To develop students ethically responsible for the benefit of society through cultural, social and economic awareness

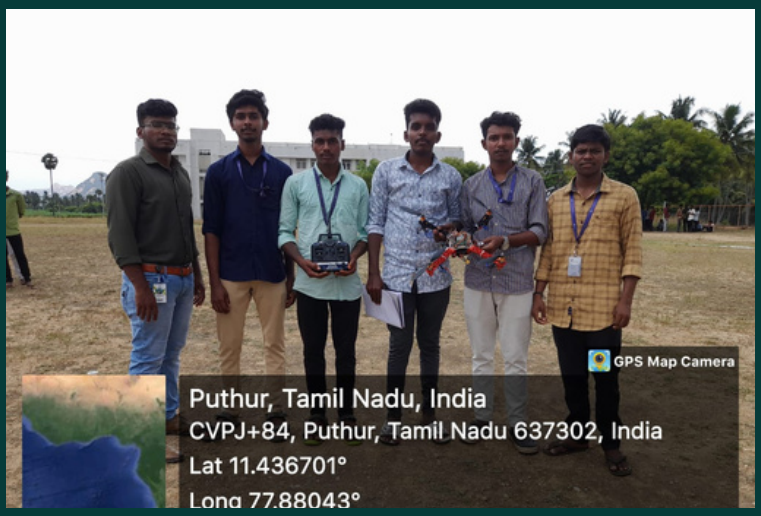
PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

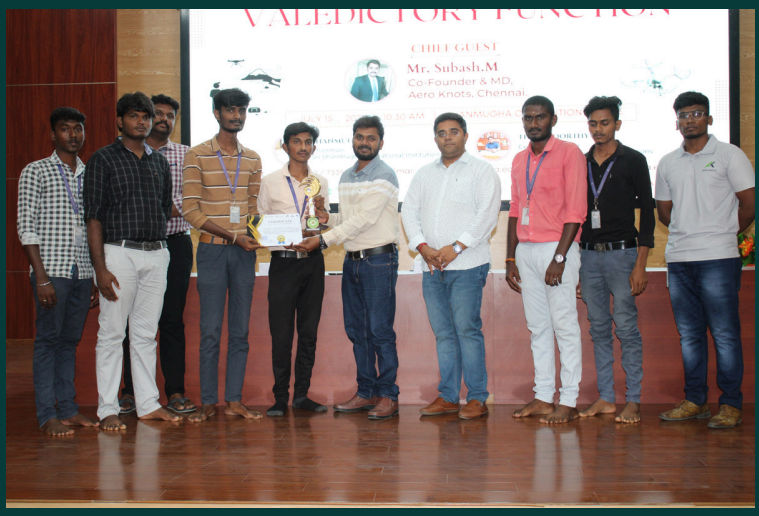
- **PEO1**: Excel in their profession by acquiring knowledge and skills in Agriculture engineering principles and practices.
- **PEO2**: Develop and practice agricultural operations in Farm Mechanization, Land and Water management and allied agricultural sectors to enhance Productivity.
- **PEO3**: Adopt to the latest trends by engaging themselves in life-long learning for research and Agripreneurial activities with moral and ethical values

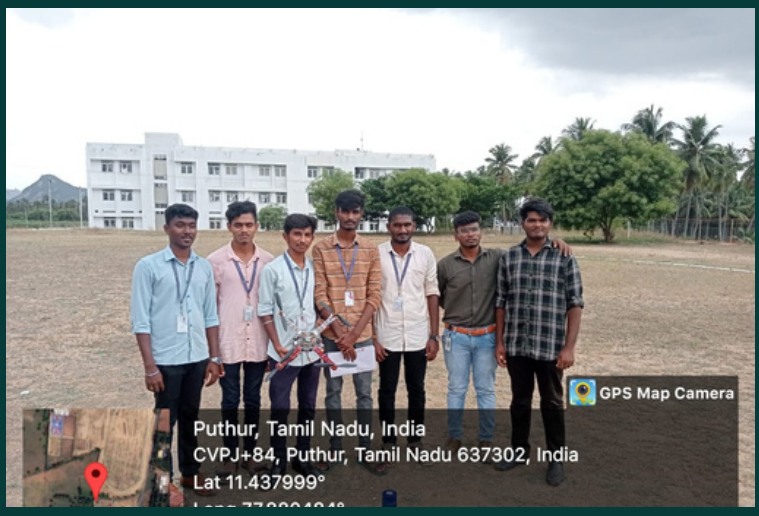
PROGRAM EDUCATIONAL OBJECTIVES (PSOs)

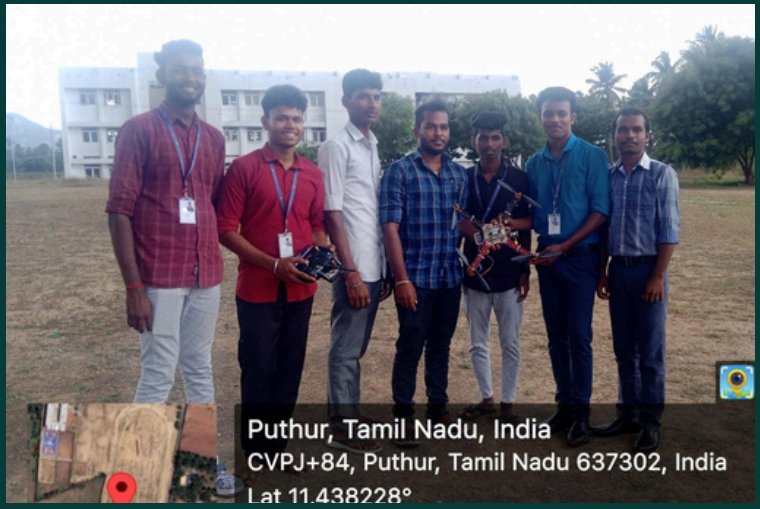
- **PSO1**: Integrate the student's skill in the field of Agriculture Engineering through Farm Mechanization, Food and Dairy Process Engineering, Soil and Water Conservation Engineering and Bio Energy Engineering.
- **PSO2**: Students can acquire knowledge on IoT, Drone Technology applications in Agriculture and Automation in Agriculture sectors.

DRONE WORK SHOP









ARTICLES - 1

CULTIVATION OF SAFFRON

Ms DHANUSHIYA
4 rd year student / Agri

SAFFRON:

Saffron plays an important role in economy of Jammu and Kashmir state. It is grown in an area of about 4000 hectares with an estimated annual production of 60 q. The crop is grown in the temperate regions of the state comprising Kashmir Valley and adjoining mountainous regions of Jammu division. For obtaining optimum production of saffron, the following improved practices are recommended

SOIL REQUIREMENT:

It requires well drained clay loam soils having a pH range of 7-7.5 free from pebbles

LAND PREPARATION:

The land should be ploughed upto a depth of 25-30 cm and subsequently, suckers rhizomes, runners etc. of perennial weeds which are uprooted during the ploughing operations, should be collected and removed from the field. The field should be thoroughly leveled filling in all depressions to avoid stagnation of water.

TIME OF PLANTING:

August to September

PLANTING STOCK:

Saffron is planted by dormant corms, select disease free and large sized corms, having at least 2.5 cm diameter. The husk dirt etc. adhering to the corms, should be removed, and the corms before planting

SEED RATE:

About 80 q corms are required to establish a hectare stand under

METHOD OF PLANTING:

The Berwar method of saffron cultivation comprises essentially of charging the soil with two underground layers of corms, one above the other, in a particular geometric way. The first or the ground layer is planted at a depth of 10-12 cm in straight furrows, opened 15 cm apart. Furrows may be opened, either with a plough or manually with hoe. Corms in the furrows are planted at a distance of 7.5 cm from each other. After planting the first or the ground layer, the second or the upper layer are planted 2.5 cm above and each in between the two rows of the ground layer. The upper layer, thus, rests a depth of 7.5 to 9.5 cm from the surface or the soil. This method of planting is also called the double storey system of saffron cultivation.

FERTILIZER APPLICATION:

Yield of saffron is increased when chemical fertilizers in a balanced from and in moderate doses are applied. The following doses of different fertilizers are recommended to increase the yield of saffron z 20 Nutrient (kg/ha) P 27.6 K 18 Urea 20 Fertilizer (kg/ha) DAP 60 MOP 33 Urea should be top dressed in the crop during the winter season (December-January). Diammonium Phosphate and Murate of potash should be applied in the month of September with the last intercultural operation.

INTERCULTURE:

Intercultural in saffron is very essential. It is done during the summer season when the corms are resting in the soil in dormant state. During this period, at least three intercultural may be done to remove weeds, mixing of dry leaves in soil and to create soil mulch for conservation of moisture.

PLANT PROTECTION:

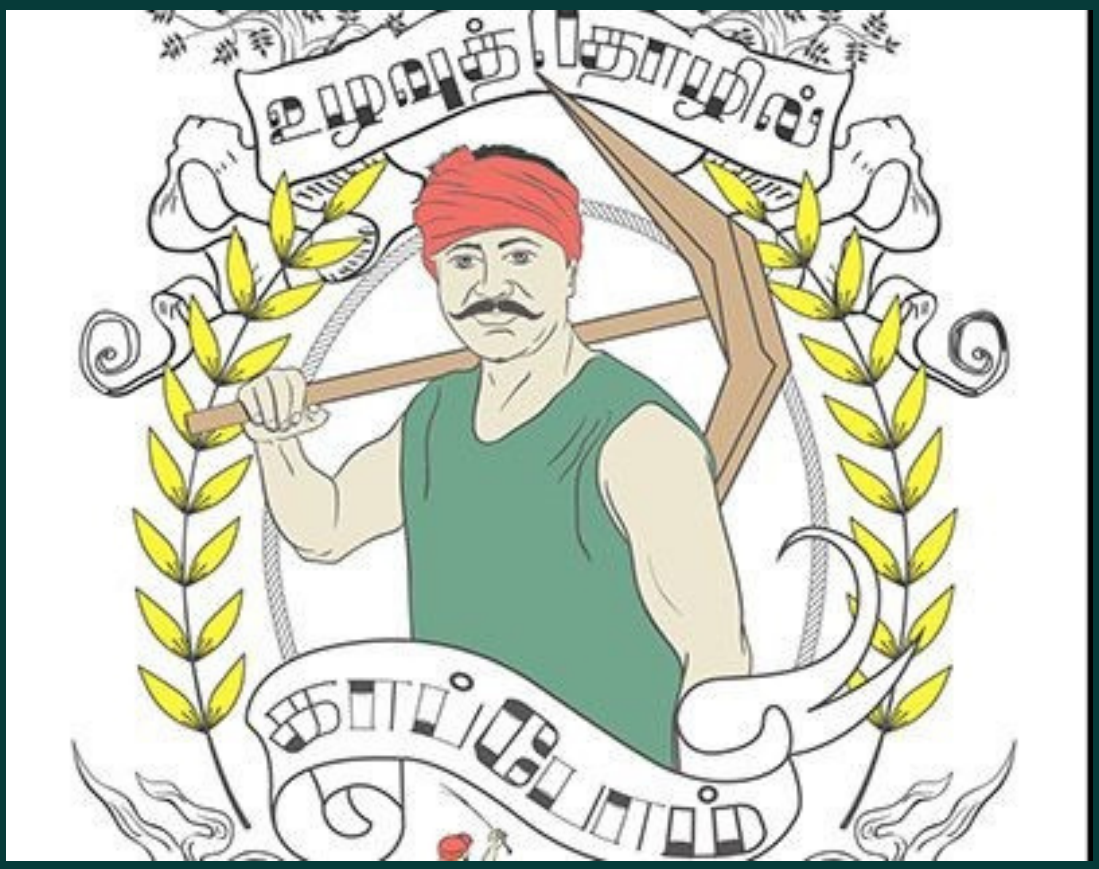
Rats are No. 1 enemy of saffron corms. For eradication ofrats, their holes should be fumigated with Phosfume tablets. For control of corm rot, treat the corms before planting with 0.1% carbendazim solution. Dip for 30 minutes.

ROTATION:

Saffron under the said intensive programme should be cultivated in a Four year short rotation with some salt resistant crop like wheat, barley, oats mustard etc.

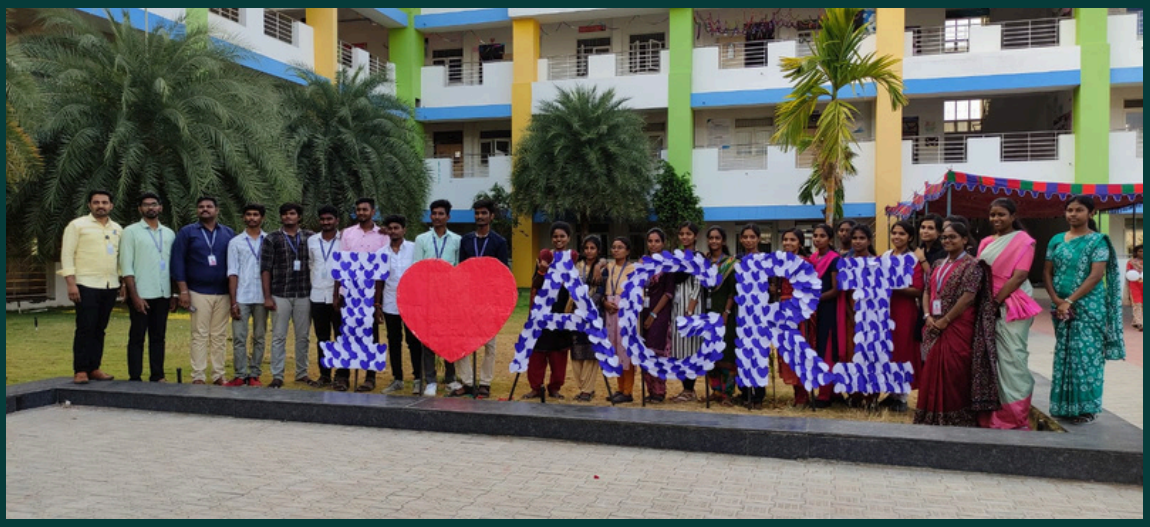
YIELD:
A hectare crop grown under the Berwar way produces during the four years, 6-8 kg saffron or 1.5-2 kg saffron per annum. Yield during the first year of planting is the lowest.

STUDENT DRAWING



M.V.Aathira
II-Agri

SYMPOSIUM'23



ARTICLES - 2

COMBINE HARVESTERS

Mrs Kumaresh
2 rd year student / Agri

There are millions of acres of land in the United States devoted to the growth of crops to be harvested in mass quantities. In 2010, 205.6 million acres of the country's three main crops (corn, soybeans, and wheat) were harvested . Since these three crops are produced in such large quantities, mass harvest is required through the use of combine harvesters. Combines are agricultural machines that cut, thresh (separate grain from a plant), and collect grain from cultivated crops. The machines are vehicles that are driven into the crop by an operator and simultaneously convert a field of growing plants into a substance which can be processed as food for livestock or humans. Figure 1 below shows a combine harvesting shelled corn (dry, hardened corn kernels typically used for animal feed).

Typically, a combine weighs over 15 tons and is approximately 13 feet high, 12 feet wide, and 12 feet long while having the capacity to hold over 2,800 gallons of grain [3]. It is a complex machine with thousands of parts that perform different tasks. With the right parts implemented, a single combine is capable of harvesting corn, oats, soybeans, wheat, rye, barley, sunflowers, and more. For simplicity, our analysis in this report will focus on the harvest of corn. To most effectively explain how this piece of equipment converts a crop to stored grain, we will analyze the main subsystems in the order that they meet the product while ignoring components inherent in self-propelled vehicles such as the engine, suspension, etc.

Subsystem 1: Header

The header of a combine is the first component to meet the crop. Its purpose is to extract the useful section of a plant from the rest of the plant and transport it to the next subsystem. The header is an implement that can be attached and removed from the front of the combine. It is designed as an attachment because different headers work best for different crops. For example, when combining corn it is more efficient to simply pluck the ears from its stalk while when harvesting oats it is better to sever the plant near the ground and process it in its entirety. Also, headers come in many different widths, but they all accomplish the same task. The head you see in Figure 2 can process twelve rows of corn and is approximately 30 feet wide, which is rather large.

Usually headers this wide have two hinges located at the fourth (counting from the left) and ninth rows so the sides may fold upwards to reduce the width while it is not in operation. The pointed tips you see in Figure 2 are simply to guide stalks into the chain and paddles between each point, which can be seen in Figure 3 where the points have been removed. The two sprockets, or small gears, shown that turn the chains are rotating in opposite directions so the paddles on the inside of either chain are moving toward the combine. These serve to pull the stalks into the header and pinch the ear off from them. Once the paddles remove the ears and pull them to the back of the head, an auger (a helical shaft that rotates, allowing objects to move up its flutes) pulls them to the middle of the header where they will enter the next stage of processing. Figure 4 depicts more clearly the auger of a corn header and the opening through which the ears of corn flow to enter the next stage.

Subsystem 2: Threshing Section

After the ears fall through the opening of the corn head shown in Figure 4,they land on the feed channel shown in Figure 5. This section consists of chains linked with cross bars that serve to carry the ears up to the threshing cylinder and concave. The threshing cylinder is one with pointed fins while the concave is a ridged screen that conforms to the curvature of the cylinder. Figure 6 below depicts a clearer view of the concave. The threshing cylinder rotates (counterclockwise in our orientation) while the concave remains stationary which grinds the ears of corn as they pass through. This grinding action breaks kernels loose and shakes them away from the cob and husks. The cob and husks go through this process again through the beater and rotary separator to ensure that most kernels have been broken loose and separated. The threshing section sends the useful part of the crop, the kernels, on a separate path than the residual waste

Subsystem 3: Cleaning Section

Following the threshing section, product can take several different paths as it undergoes “cleaning”. The a visual representation of this flow of product where item 16 denotes the grain tank. The product larger unusable waste such as the husks and large pieces of stalks gets pushed onto the straw walkers by the rear beater .In this graphic there are 5 separate straw walkers shown which serve to push the straw towards the back of the combine and eventually expel it onto the field. They do so by way of a rotating crankshaft like the one shown below in Figure 8 which allows one or more straw walkers to make contact with the straw and continuously drag it toward the back of the combine. These walkers are also vented so they may serve as a sieve to allow any loose grain and smaller pieces of straw to fall through to the upper sieve.

Subsystem 4: Storage Section

Once the grain is cleaned, it is ready to be collected and stored in the grain tank. The auger previously mentioned that is located below the sieves transports the product to one side of the combine. At the end of that auger is another vertical one that raises the grain to the grain tank located on top of the combine.

Once that occurs, the operator must discharge through one last auger usually into a wagon or trailer not attached to the combine. Item number 20 in Figure 10 is an auger that pushes the corn out of the grain tank and into the discharge auger. This discharge auger must be very long to hover above and eject grain into a wagon, so it pivots at its base to be oriented parallel to the combine during operation but perpendicular to it when discharging. Figure 11 shows a combine unloading a tank of grain.

Summary of System:

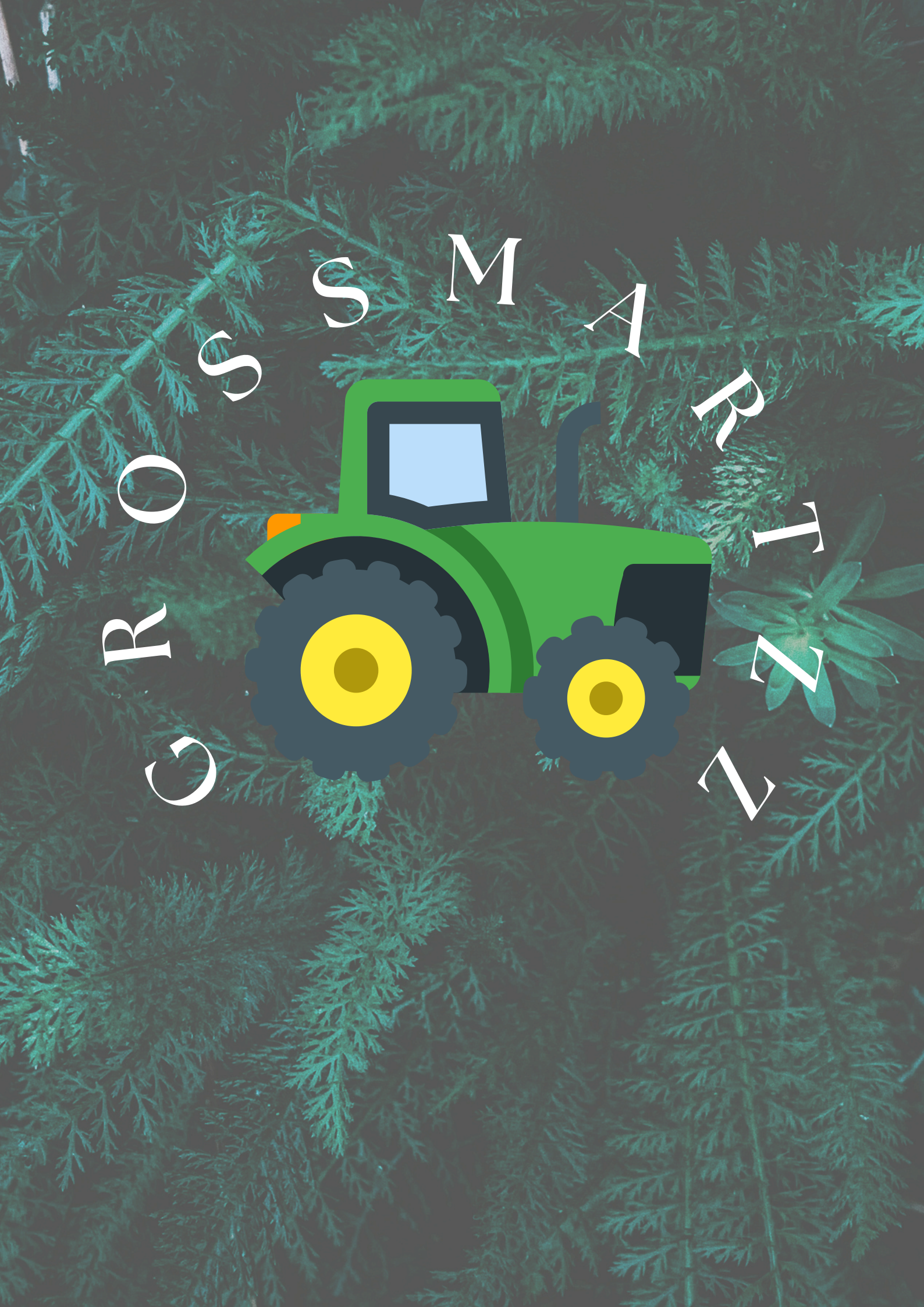
Combine harvesters consist of thousands of parts working together to take in a growing crop from a field and transform it into clean grain to be used as food for livestock or humans. Different parts belong to different subsystems that play various roles in order to efficiently collect massive amounts of grain. To summarize, the four main subsystems and their purposes are listed below in order of which they meet the product:

1. Header
   - Collects usable product along with its stalk from the field
   - Transports the plant to the threshing subsystem

2. Threshing Section
   - Breaks grain free of plant
   - Transports product to the cleaning subsystem

3.Cleaning Section
   - Cleans grain by filtering out and ejecting chaff
   - Sends incompletely threshed product back to the threshing section
   - Transports clean grain to the storage section

4. Storage Section
   - Moves and collects clean grain in the grain tank
   - Unloads product when the tank is full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