

Gujarat



Gandhinagar,
Ahmedabad

Maharashtra

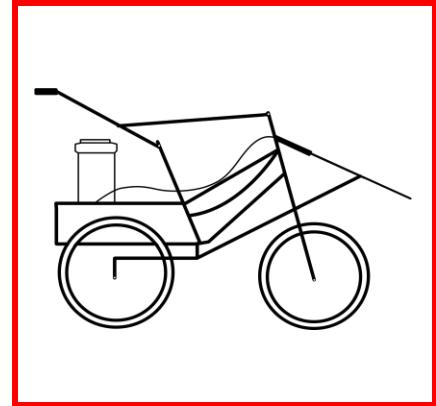


Malegaon,
Jalgaon

Farmers



=



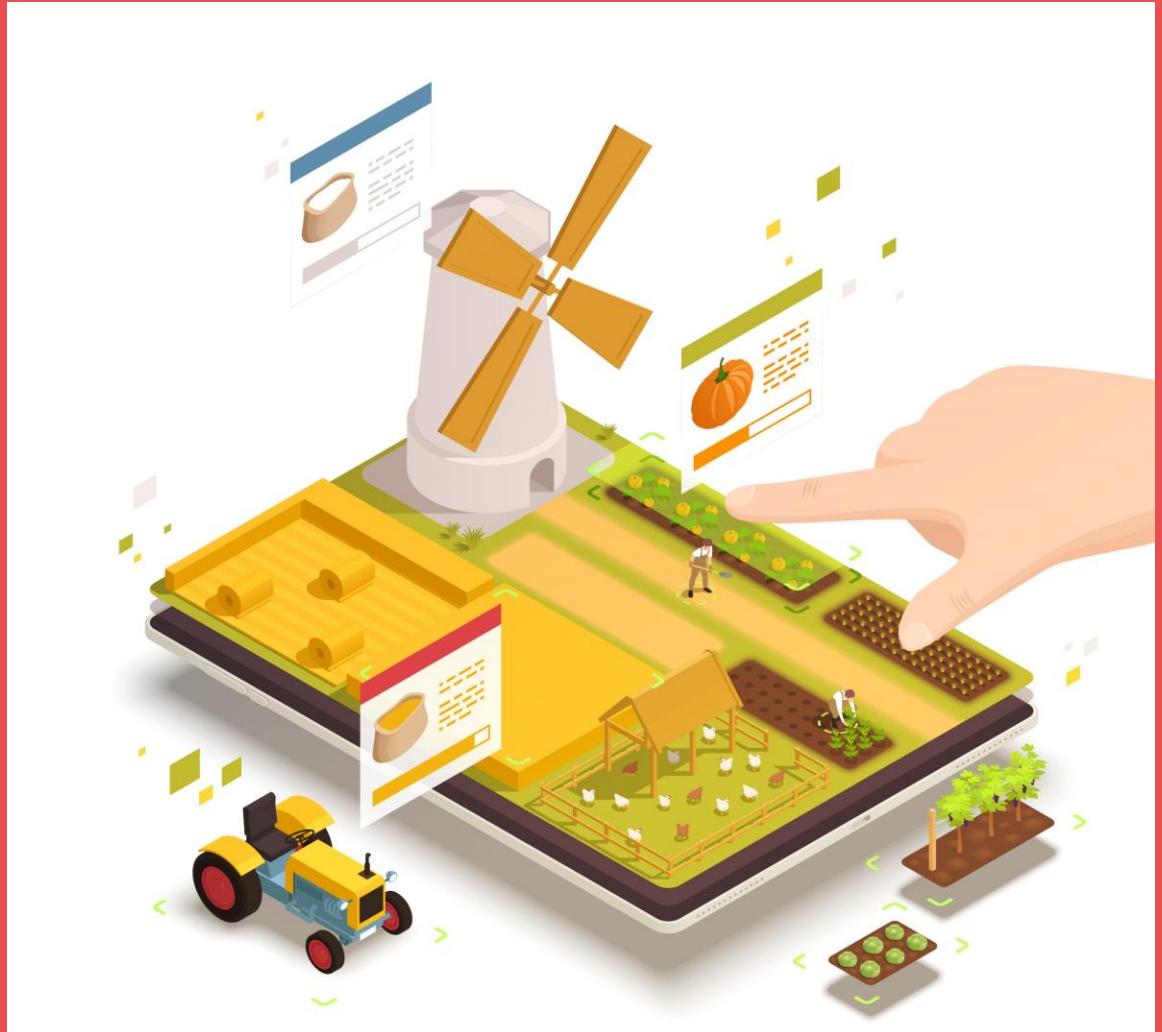
2 States

4 Different
Villages

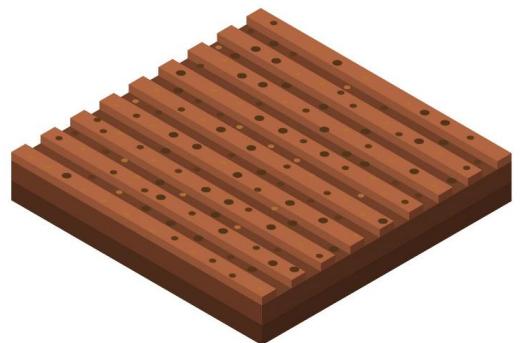
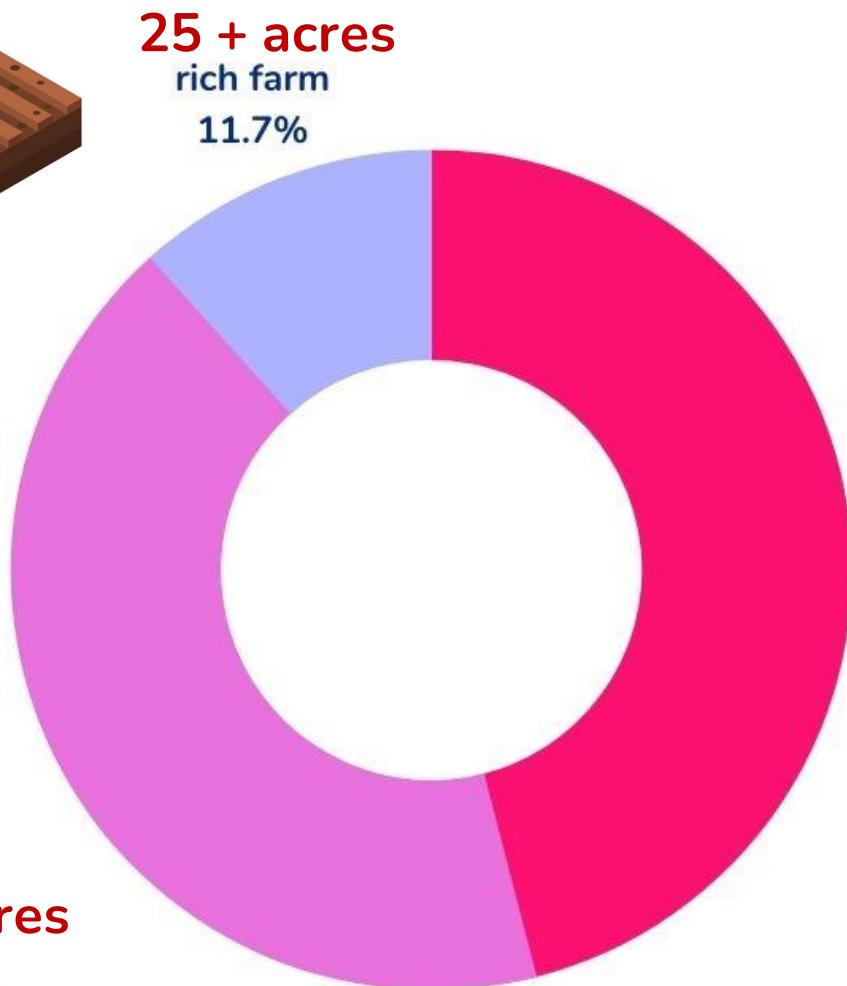
25-30 Farmers

28+ Farmers

Scope of cart at a macro level

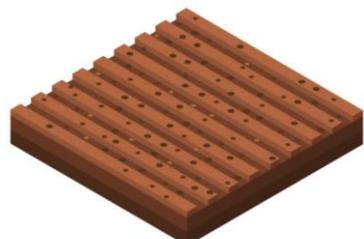


Size of land vs poor/rich farmer in India

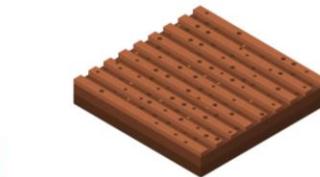


average farmer
42.4%

10 to 25 acres



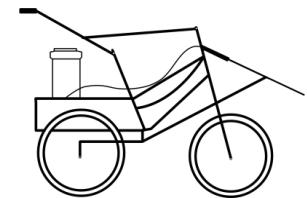
25 + acres
rich farm
11.7%



poor farmer
46%

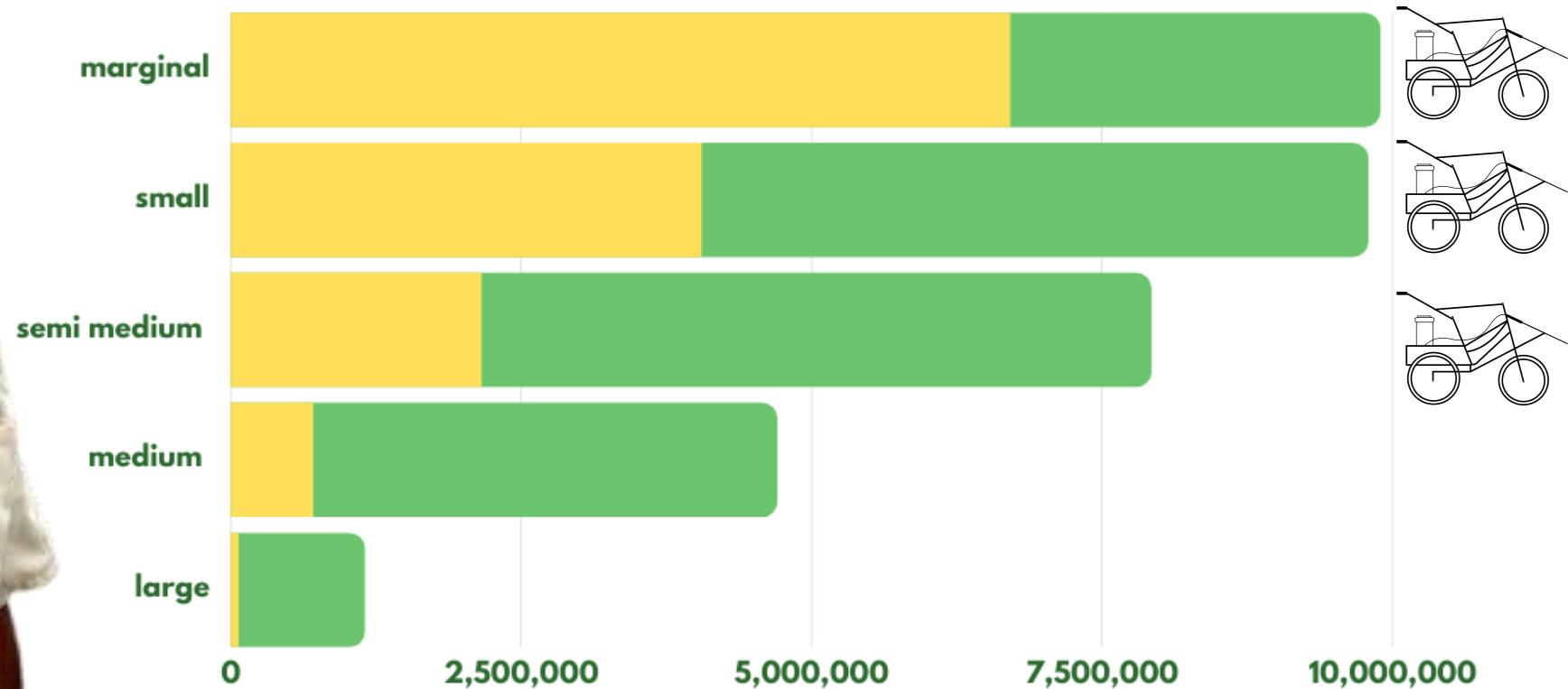
5 to 10 acres





60 out
of 100

% of Land holding in Maharashtra



What New have we done



**Going
Beyond the
Cart**

A macro picture
of the
agriculture
system



Crop
selection



Soil
preparation

+



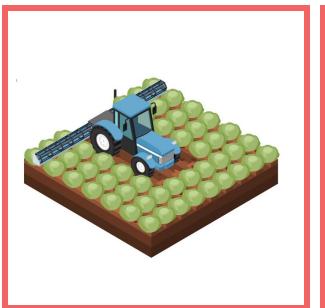
Sowing

+



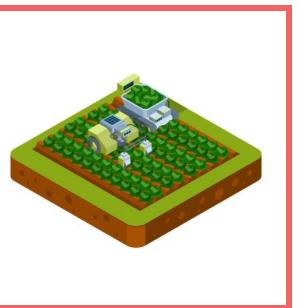
Irrigation

+



Maintenance

+



Harvesting
& Post
Harvesting

Mono Crop Farming

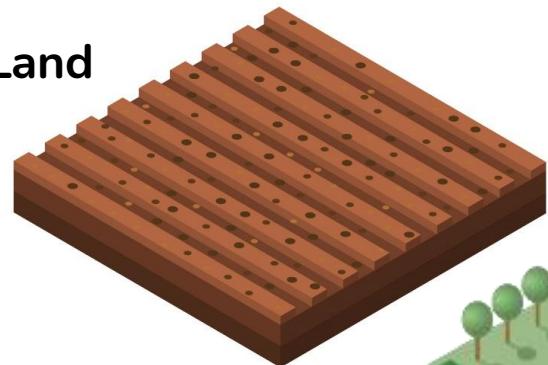


**To know the present, we
need to understand the
past a bit**

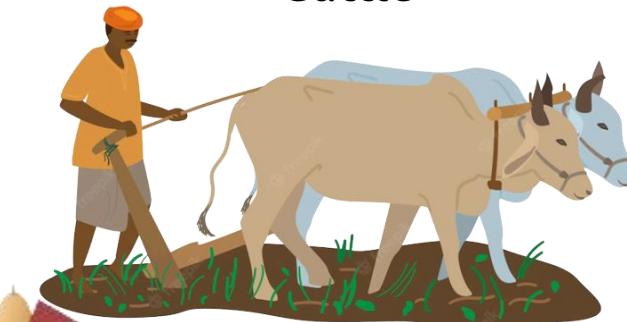
A story of Traditional farming without pesticide

- Use of organic manure & fertilizers
- Using organic & traditional methods of farming, sustainable & organic in nature

Land



Cattle



- Owned Cattles who grazed on farms
- Cattle dung used as manure
- Adequate Soil nourishment lead to healthy crops

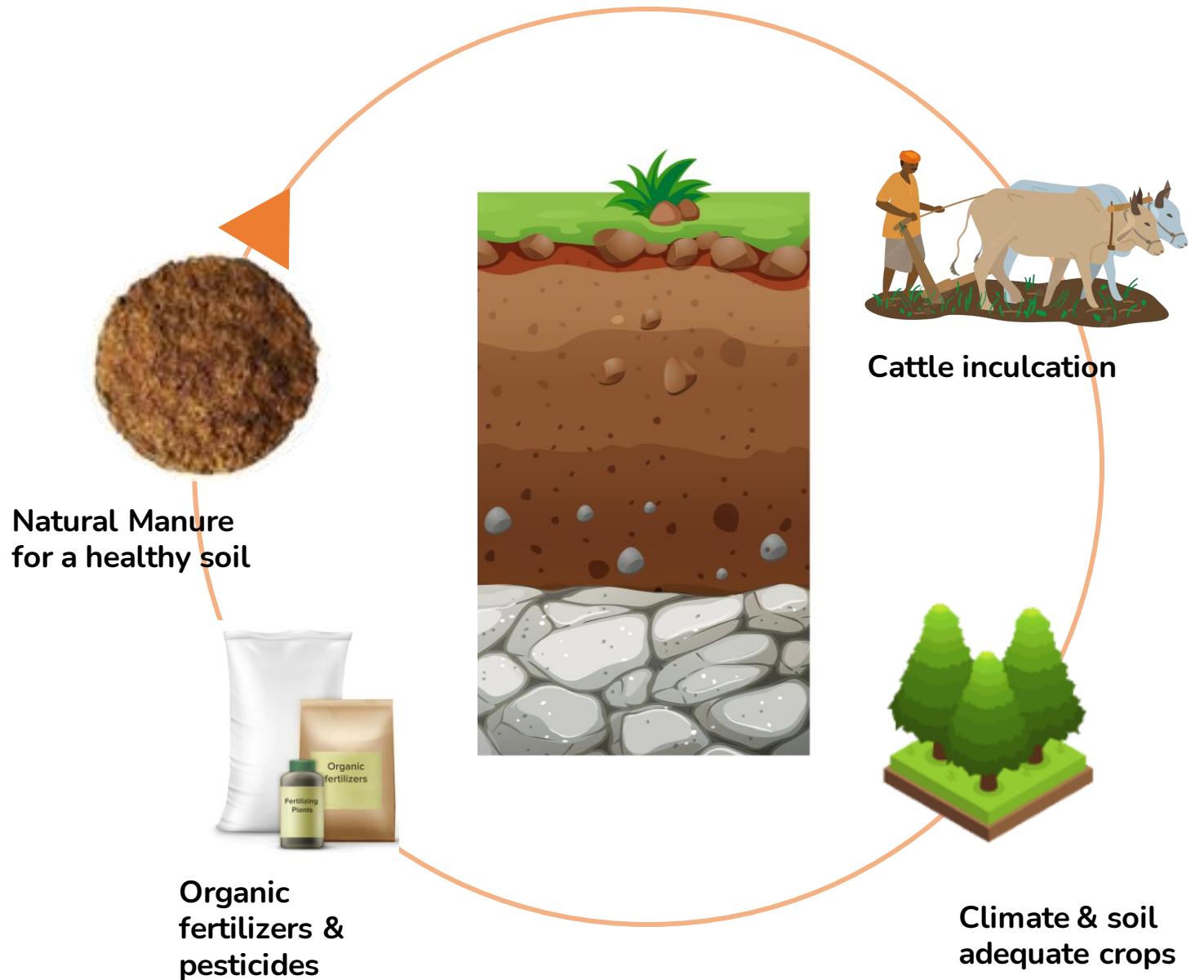


Nature

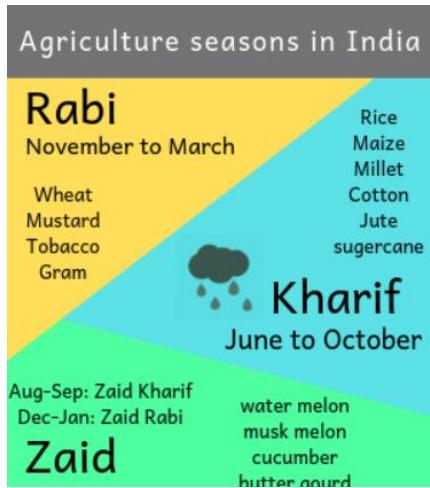
- Grew crops that were soil & climate adequate
- A combination of crops kept the soil fertility
- Also ensured repelling of pests

Balanced flora and fauna

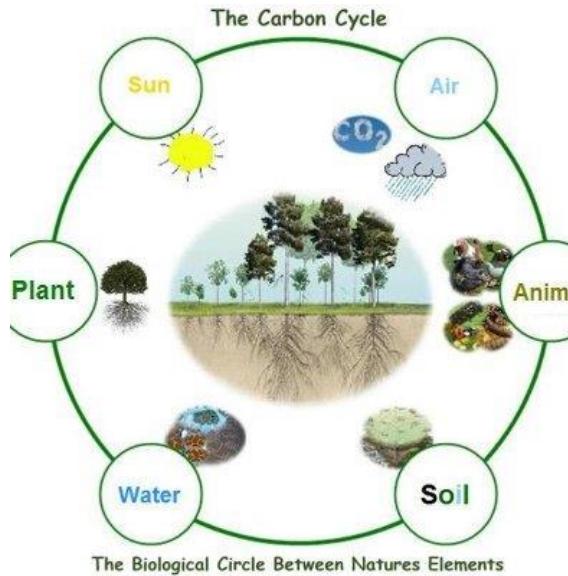
Practicing Permaculture & Organic Farming



Key things which were promoted in traditional farming



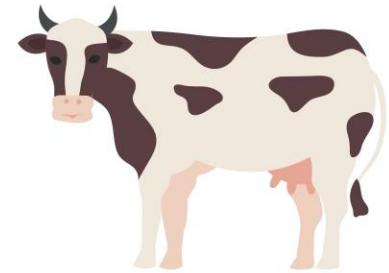
Seasonal crops
Rather than mono
farming



A permaculture type
environment

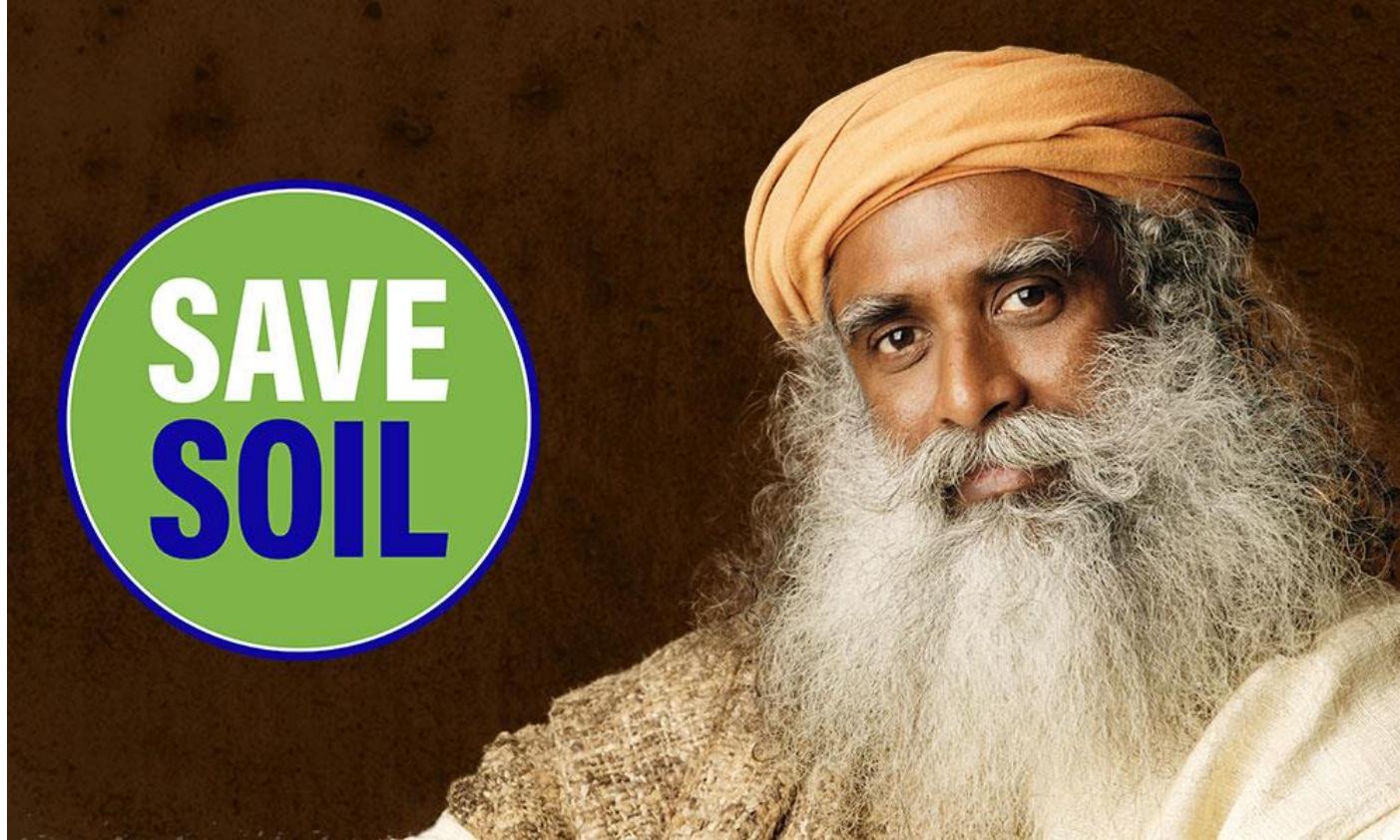


Zero Tilling



Nothing can
beat cattle

Awareness towards saving the soil



Big players taking initiative to contribute back to the nature. Few of them dropped their profession and started farming as Organic farmers. Few of them initiated social working in the direction of saving the soil and cattle.

Save Soil a global movement launched by Sadhguru, to address the soil crisis by bringing together people from around the world to stand up for Soil Health.

What is the story now

"Farmers just want a '2 minutes Maggi' solution so that they can rest and go to mela every day. Farmers are more involved on cell phones & YouTube , and they look at other people's farm and do nothing on there's. They have forgotten what their fathers have taught them. Only the top farmers are doing something"

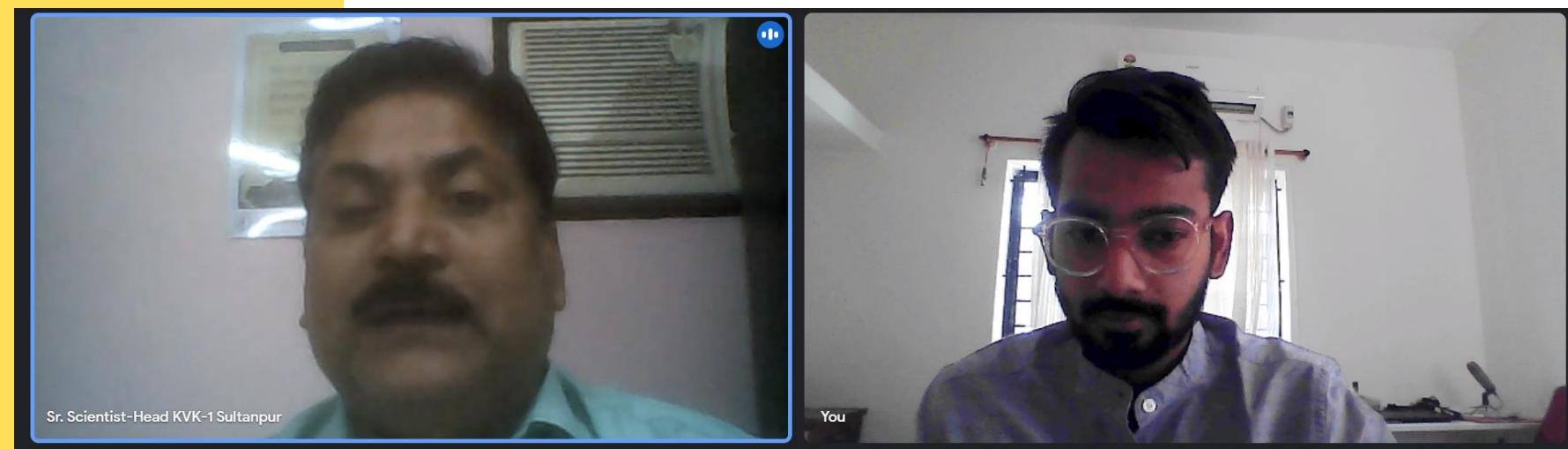
Krishi Vigyan Kendra

Dr. Jayendra Bahadur Singh (Agriculture Extinction department)

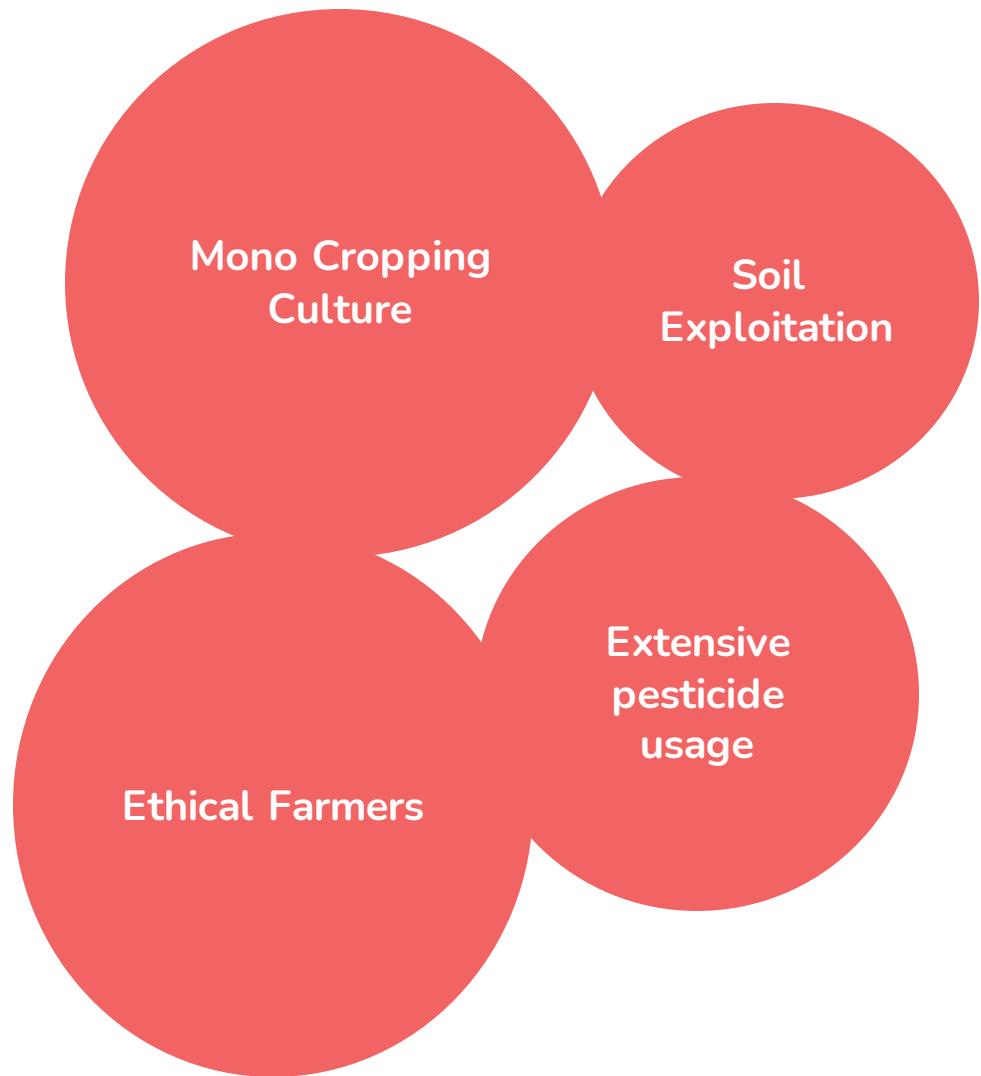
Dr. Ajay Singh (Agriculture Extinction department)

Dr. R.K Singh (horticulture Department)

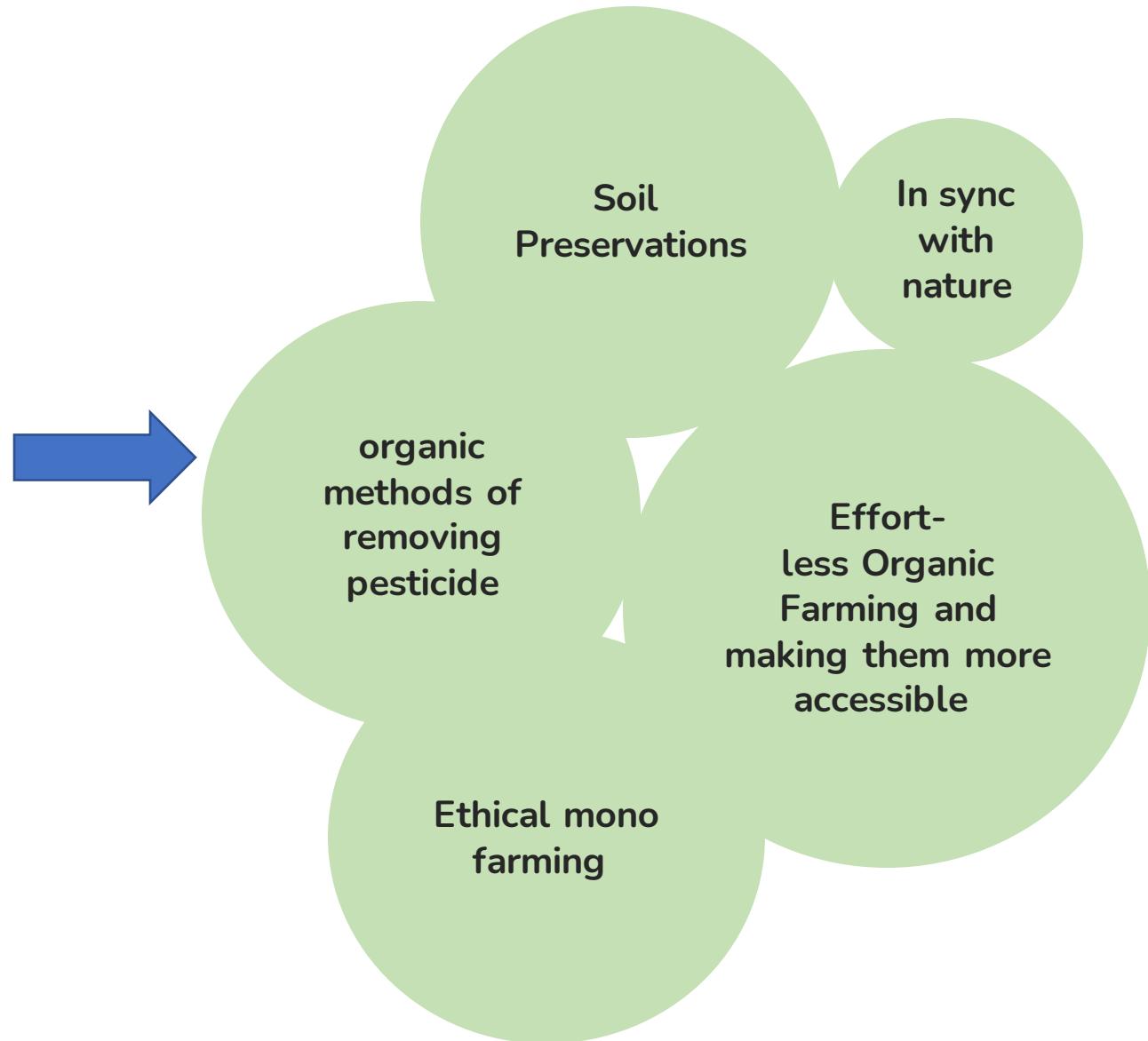
Dr. S.P Mishra (Agri foresting department)



Where we are now



Where we should head



Tackling soil exploitation







Good soil

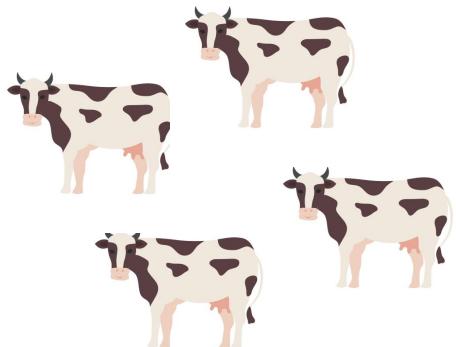


Bad Soil

Eventually Every poor farmer's land
is turning hard and filled with gravel

Huge use of cattle

1 month



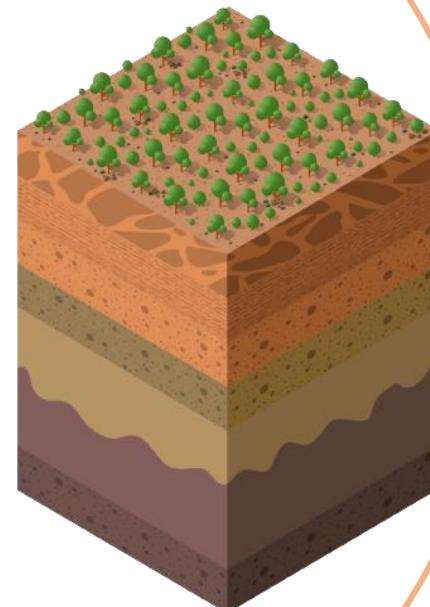
- Baithak
- Pure Gobar mix
- Let abundant cows graze on farms
- They have their own cow shala
- Sometimes order Gober from big dairy farmers
- Feeding Chara (which is expensive) after harvest to them



Increasing the Soil & Plant Health

The Process

Microbes that aid in the process:
bacteria, actinomycetes, fungi, protozoa and nematodes.



Organic compost inhouse

1 month

- Using labors to make high quality compost
- Buying processed organic manure



Soil mixer expensive equipment's

Use every 15 Days



- Ensuring adequate soil tilling
- Using Expensive Machines for faster output
- Hire Labourers to do the task

Making Organic compost in house Method



Cow
Dung
(Gobar)



Cow
Urine



Rock
Phosph-
ate



Earth-
worms

=
= 3
Months
Process

But the process is Laborous & Time intensive process



" We know that Soil
needs to be taken care
of, and it's quality is
degrading,
but we can't because we
don't have time or
the choice."

What a Poor Farmer Does

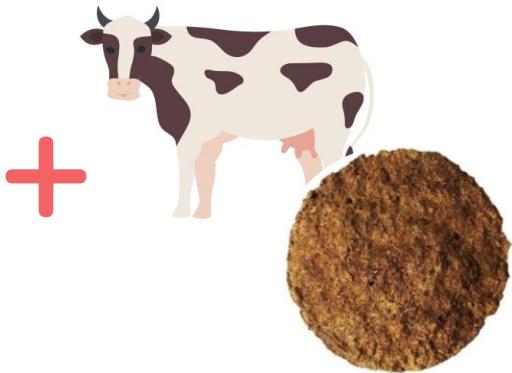


No Resting time for Soil



Always is recovering loss, so they are impatient.

Hardly uses cows



- Shortage of Gow Shala so very less cow dunk is available to the poor farmers
- First preference to rich farmers

No use of organic manure

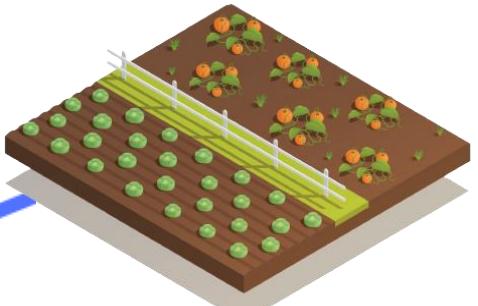
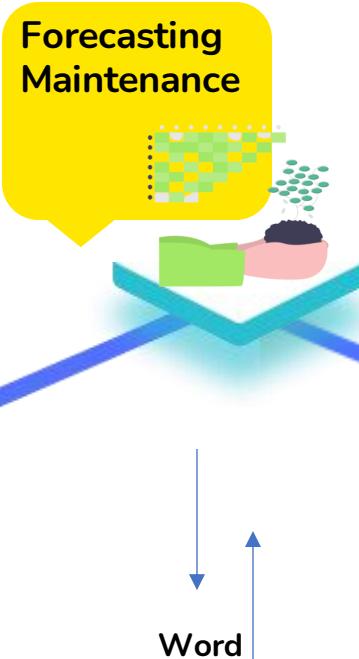
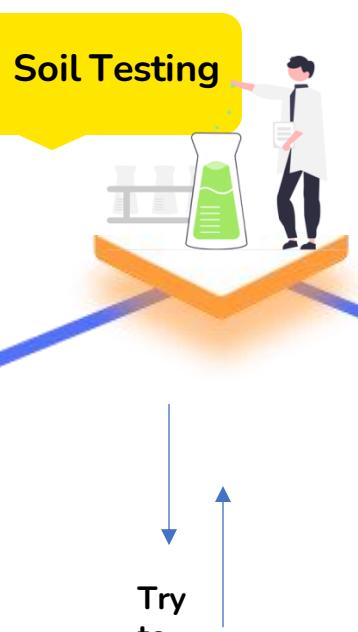


- They only give 15 – 20 days to soil restoration which is include in the process of tilling.
- They don't want to make organic compost because of time shortage and Labour intensive tasks.

Poor Soil Quality



Poor Soil Quality results in Malnourished crops



Saves money
for future
expenses



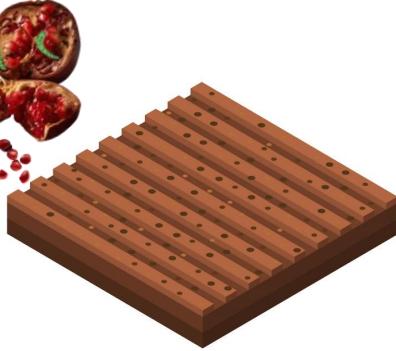
Copies other and
big farmers steps



Trust his
capabilities through
past experiences



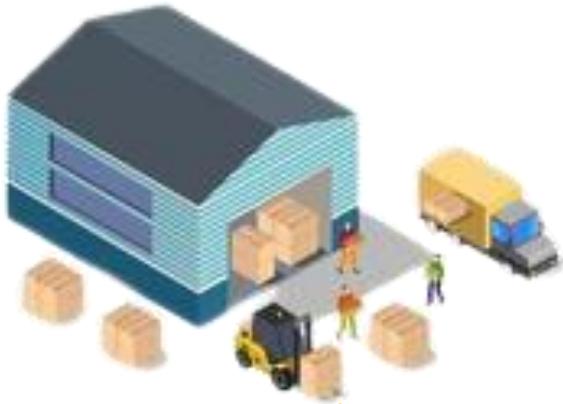
Never
interested in
trying something
new



Bad yield



Leaves



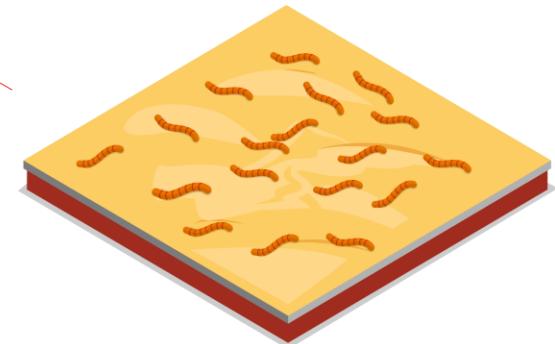
Rock Salt



Manure

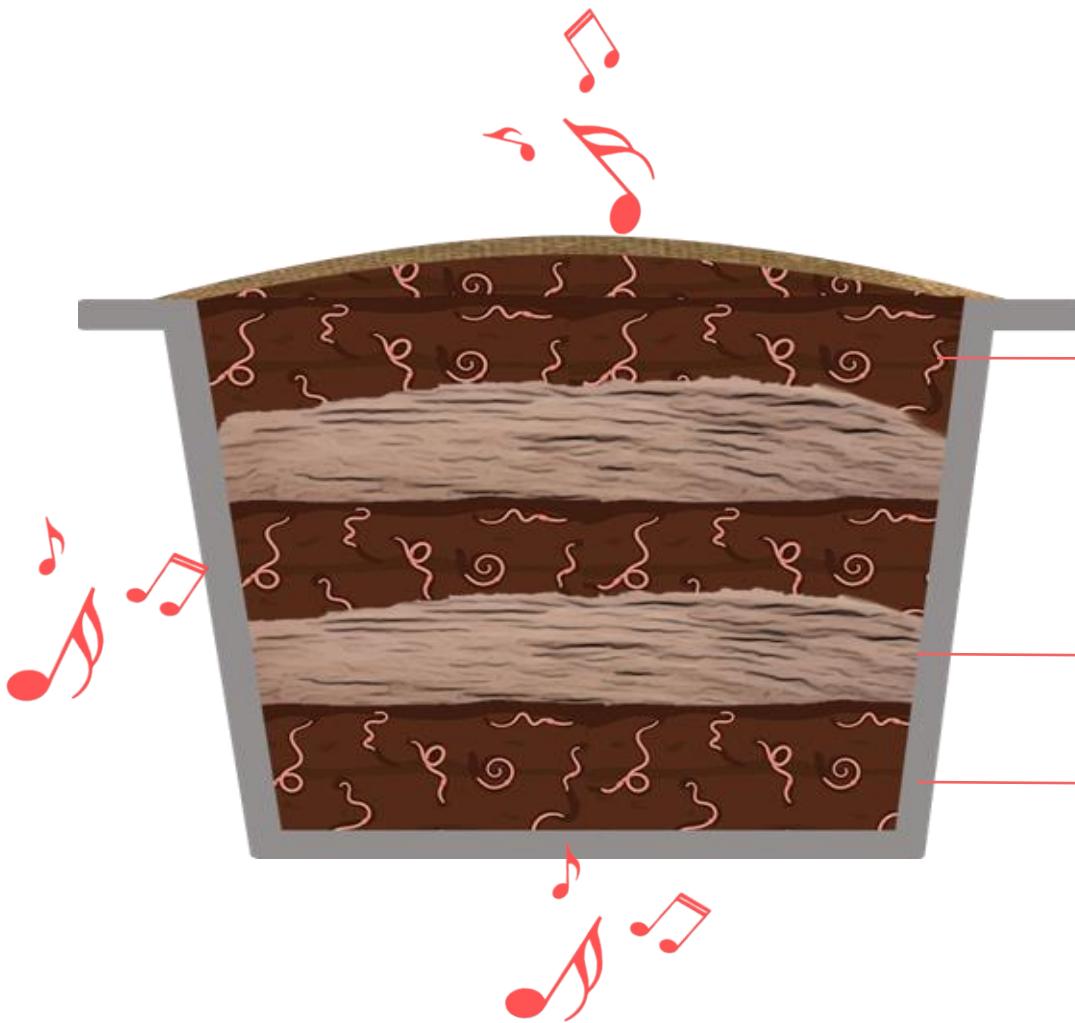


KG Agrotech Warehouse
Collects all the necessary
resources



Earthworms

Making Organic Farming Quick & Easy



Rich Farmer

Mixture



Earthworms



Rock Phosphate
25%



Cowdung 75%



Cow urine



KG
Agrotech
centre

60-75 days
at it's
compost
making
centre

30 Days
+
25 Days
+
Total 30
days
of resting
period

+

Approx 90 days
process
At the farm

Only 15
Days
required
At the farm

6. 3
different
Strategy
proposals

Use it at the farm

1. Call KG Agrotech



2. KG
Agrotech
Service
men
'test soil'

3. Get the results and
the report

5. Get the delivery at
your farm

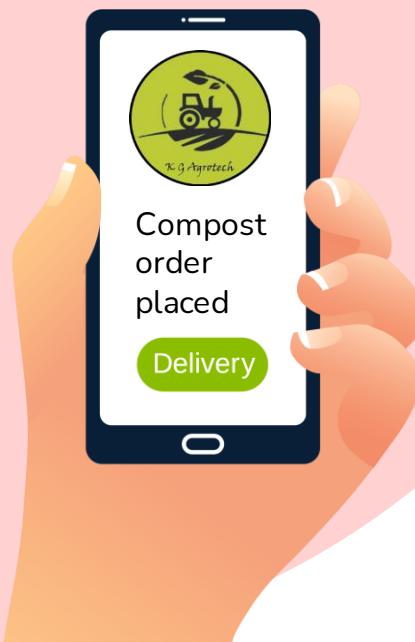


4. Manure/ Manure raw
ingredients packed for
the farm at its centre



1. Providing the farmers with a 'Raw Kit'

1. Order the manure from KG Agrotech



2. KG Agrotech packs the raw contents for the farmer and delivers it to farm

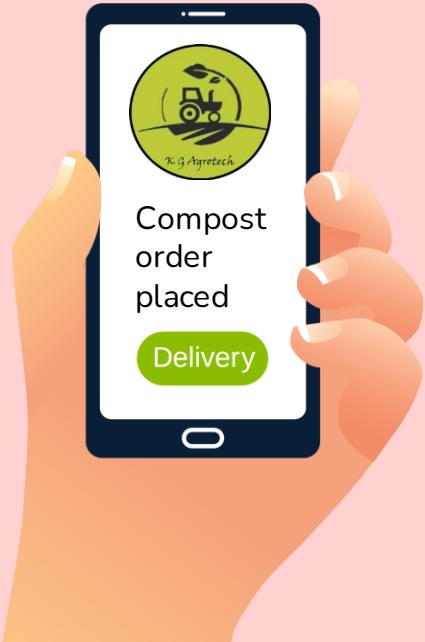


3. Farmers do the compost process And Spread it on the farm with the cart



2. Providing the farmers with 'Activated soil'

1. Order the manure from KG Agrotech



2. KG Agrotech packs the activated soil for the farmer in required qty



3. KG Agrotech delivers it at your farm

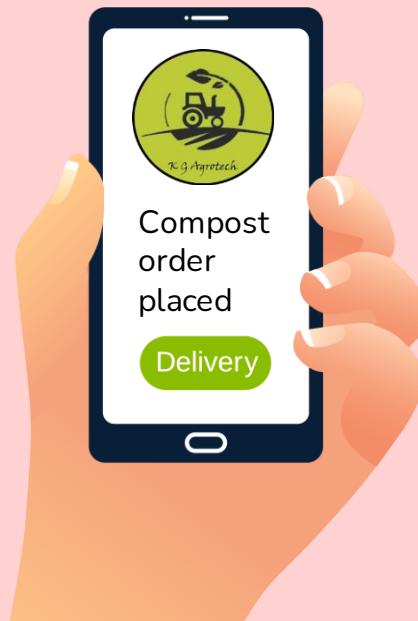


4. Mix it with soil and water & spread it in the farm using the KG cart



3. Providing the farmers with end-to-end Manuring Service

1. Order the manure from KG Agrotech



2. KG Agrotech comes to your farm with the activated soil



3. KG Agrotech spreads the manure using its machine at the farm



Cart with Manure spreader attachment





Motor integrated for
weight and force
concerns

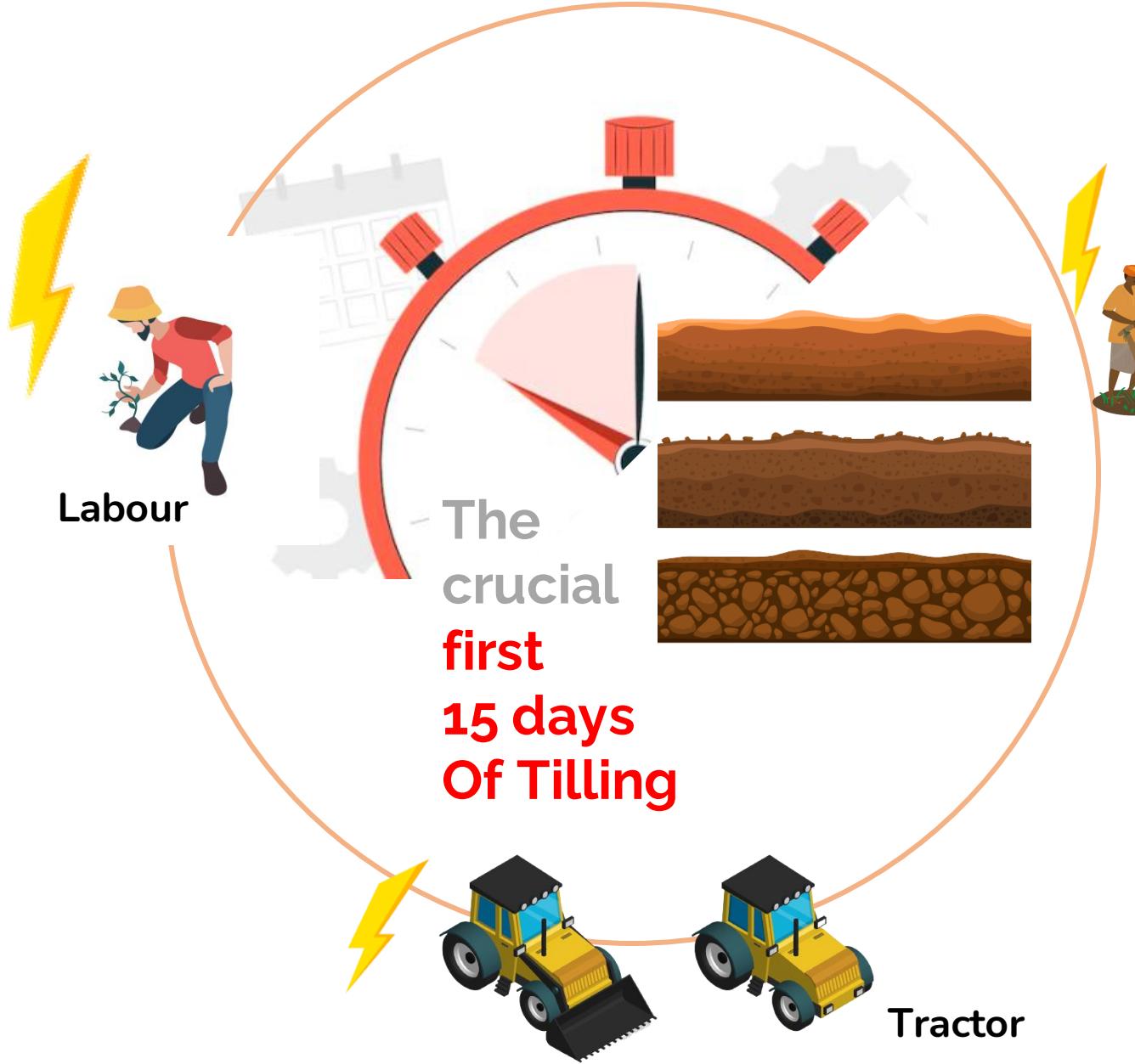
Problems in Soil preparation

“



**"Tractor is too
expensive, and
bulls are expensive
too, we can only
borrow"**







The bulls
were cheaper
and was easy
to maintain.

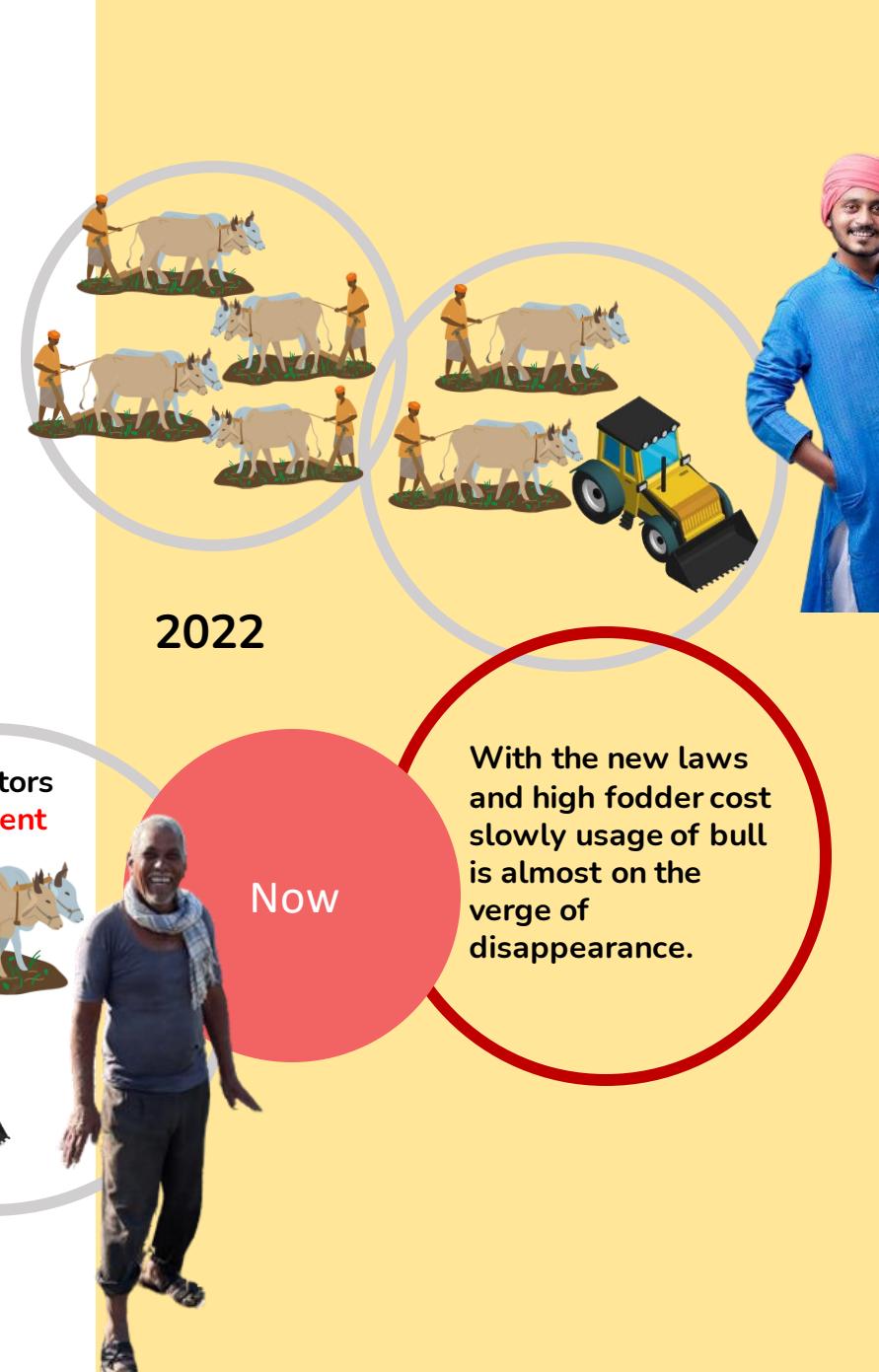


Tractors
on Rent



Now

With the new laws
and high fodder cost
slowly usage of bull
is almost on the
verge of
disappearance.



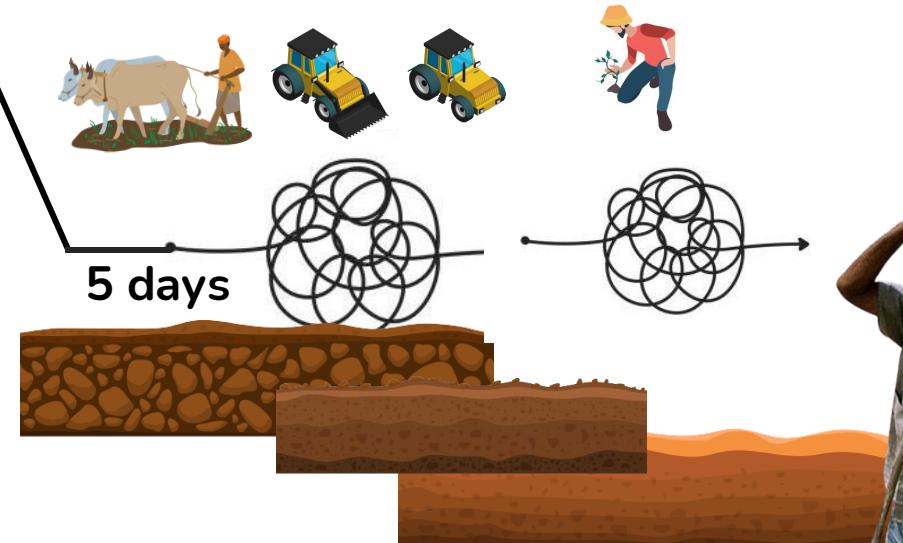
Timeline of the soil preparation



Rich don't release the resources until they have tilled their field . They then rent out the tractors to the poor.



15 days



5 days

The poor farmer starts firefighting and which in turns reduces the soil quality

No. Of days

Ideal time for tilling

Demand

0

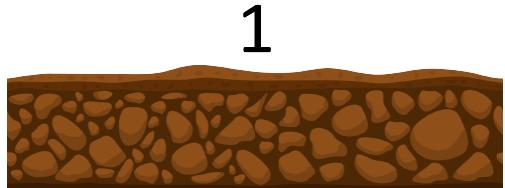
5

10

15

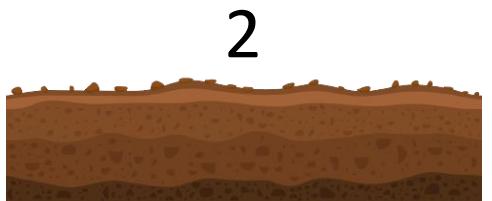
20

What happens in these
15 days



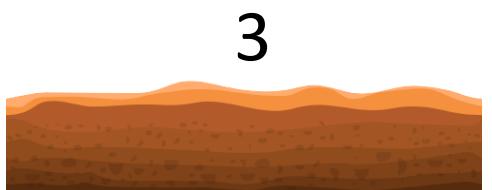
1

Ploughing includes loosening
and digging of soil



2

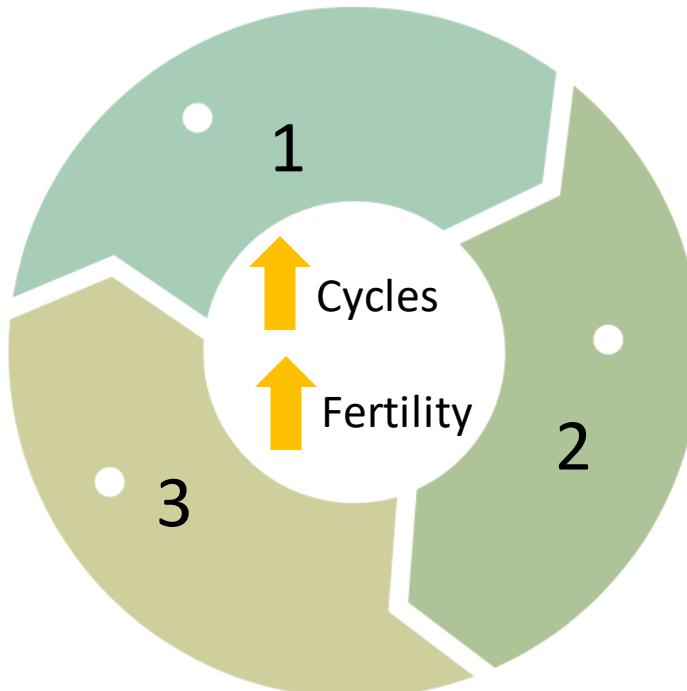
Leveling is simply dummy text
of the printing and typesetting



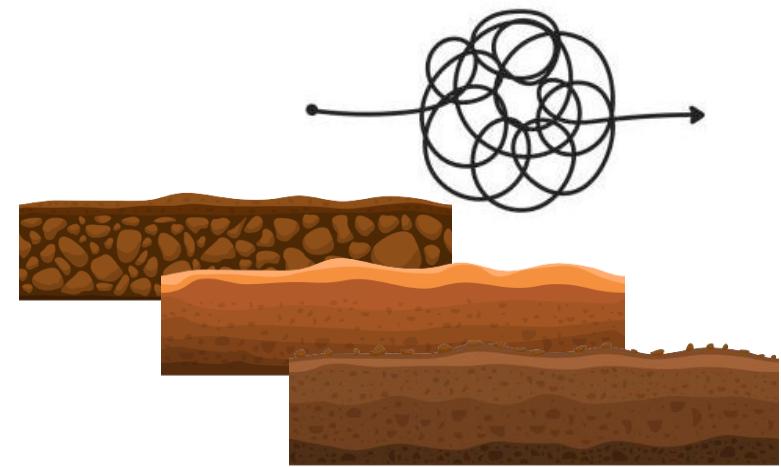
3

Manuring after ploughing and
levelling, manure is applied to
further stages of farming

The Ideal Cycle



Chaotic Cycle



In the situation of firefighting
farmer tries to finish the
process in lesser time than
advised

He skips the process without
getting things done

Resultant soil didn't get
prepared for sowing and
remains unfertile



→ Many crops need a bed, and that bed needs to be leveled. This becomes a labor-intensive process

Types of crops which uses beds for growing crops

All the crops which grow underground



Onions



Garlic



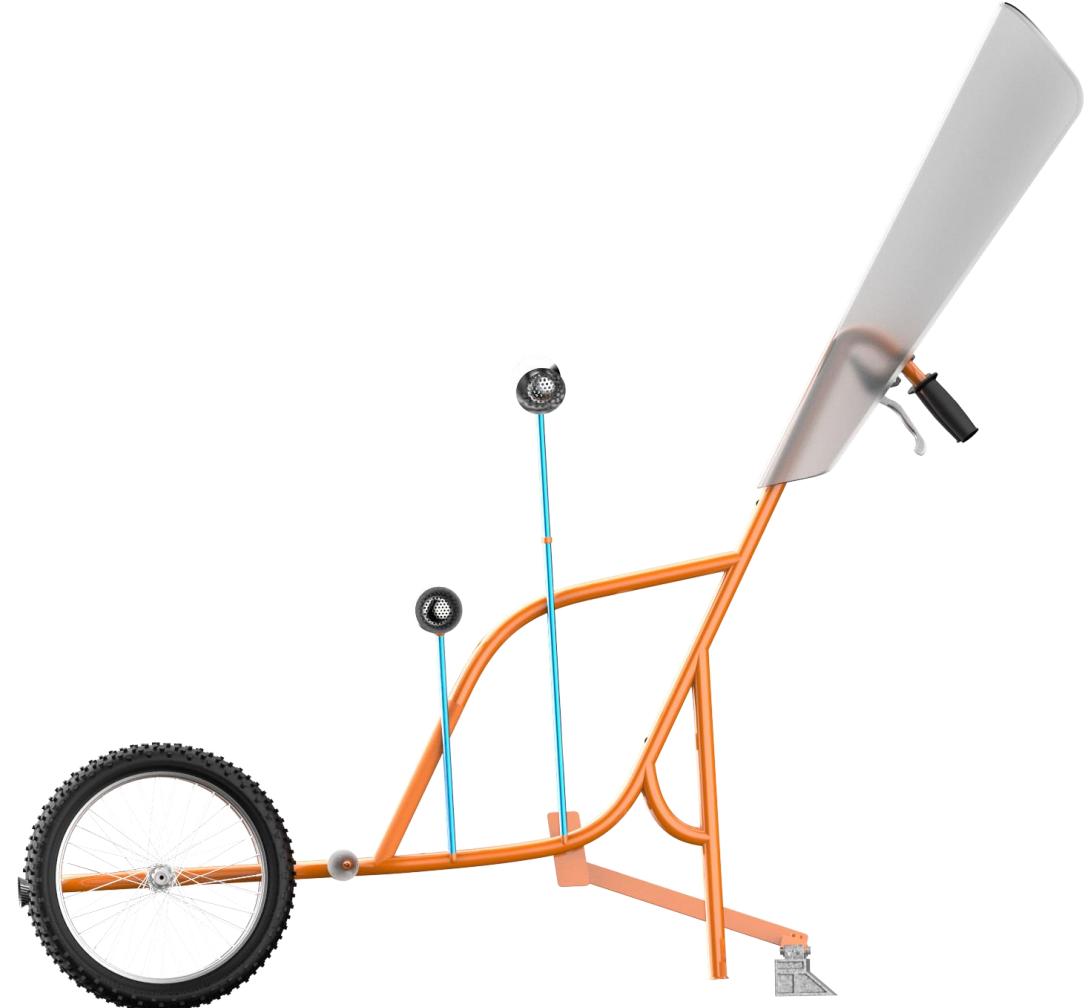
Ginger



Carrot

"Many poor to average farmers are investing 100 % of the money on these bed crops "

1. Cart with Leveller attachment



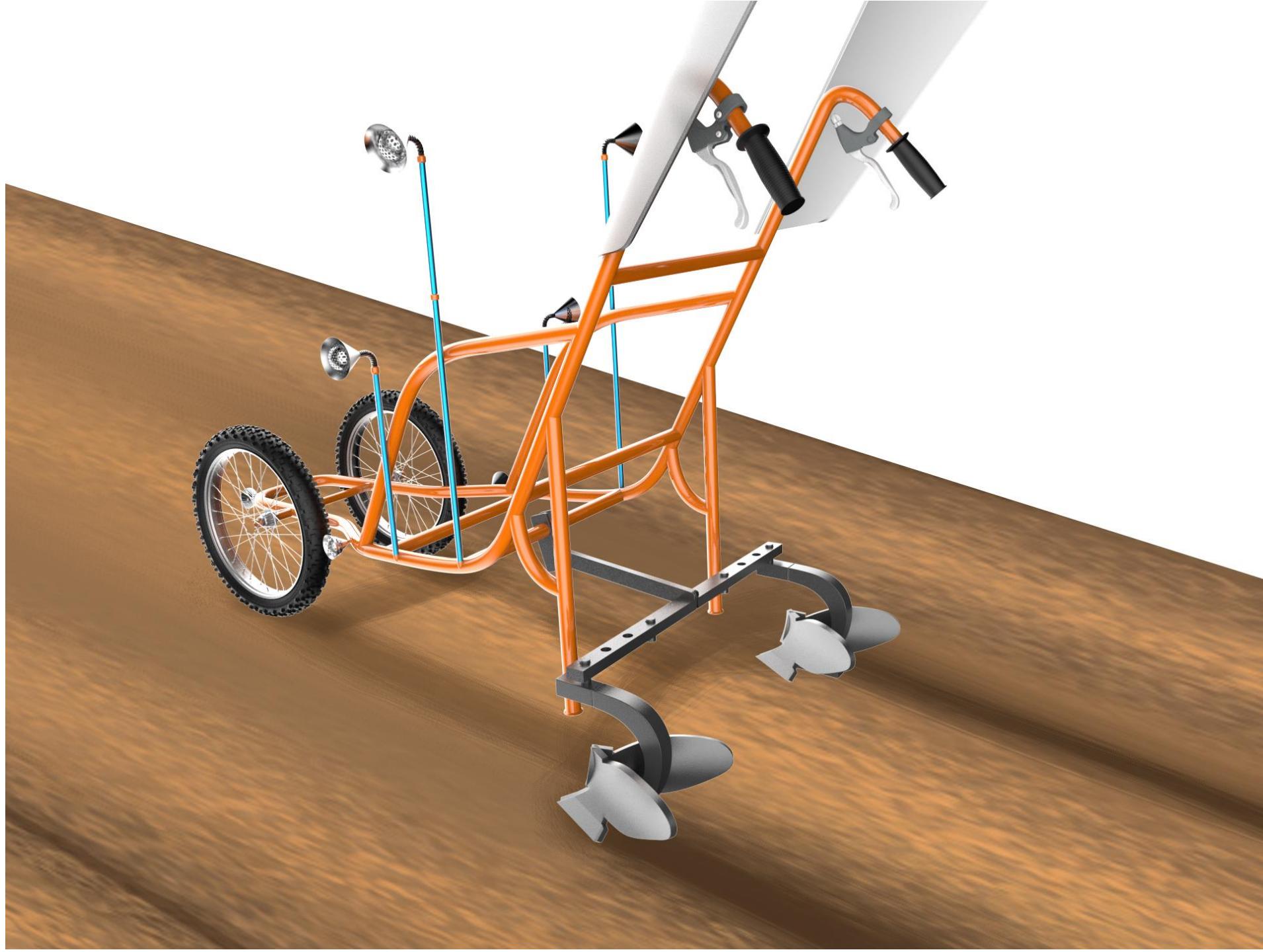
Cart with Leveller attachment

Motor integrated for
weight and force
concerns



2. Quantification in row making- Row ridger attachment

Adjust and make rows
according to the
required row distance
for each crop



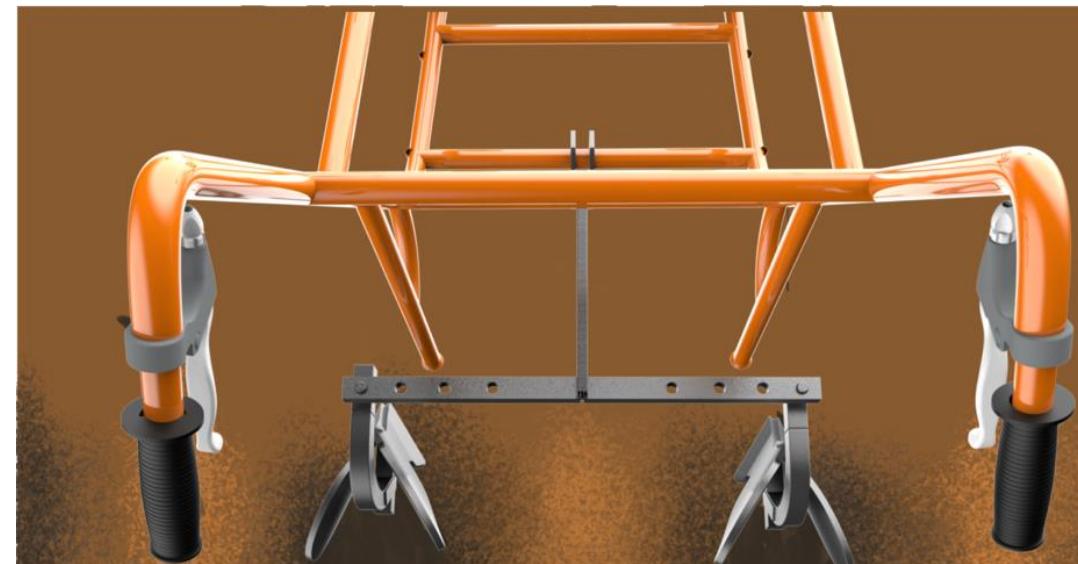
Adjustable Row ridger



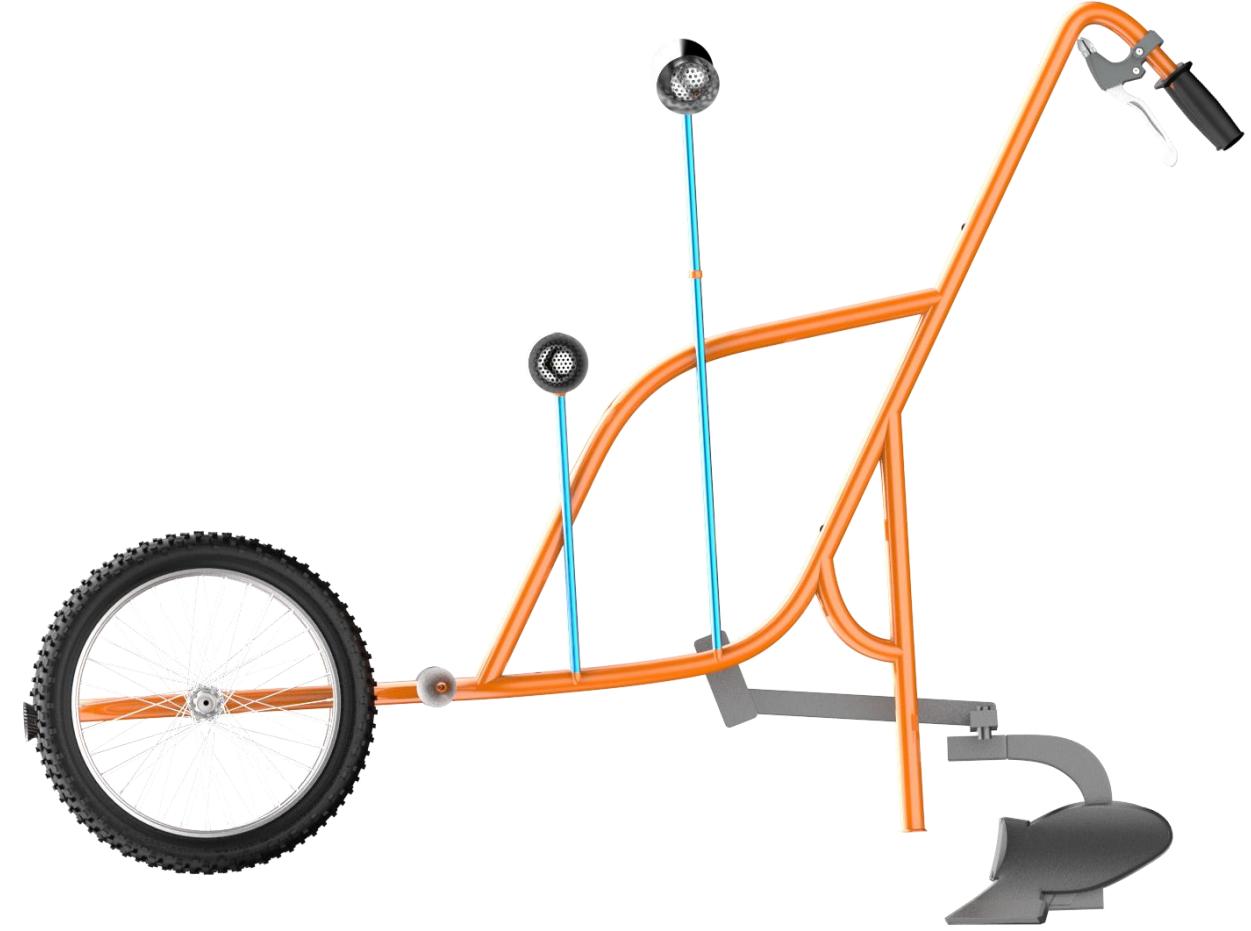
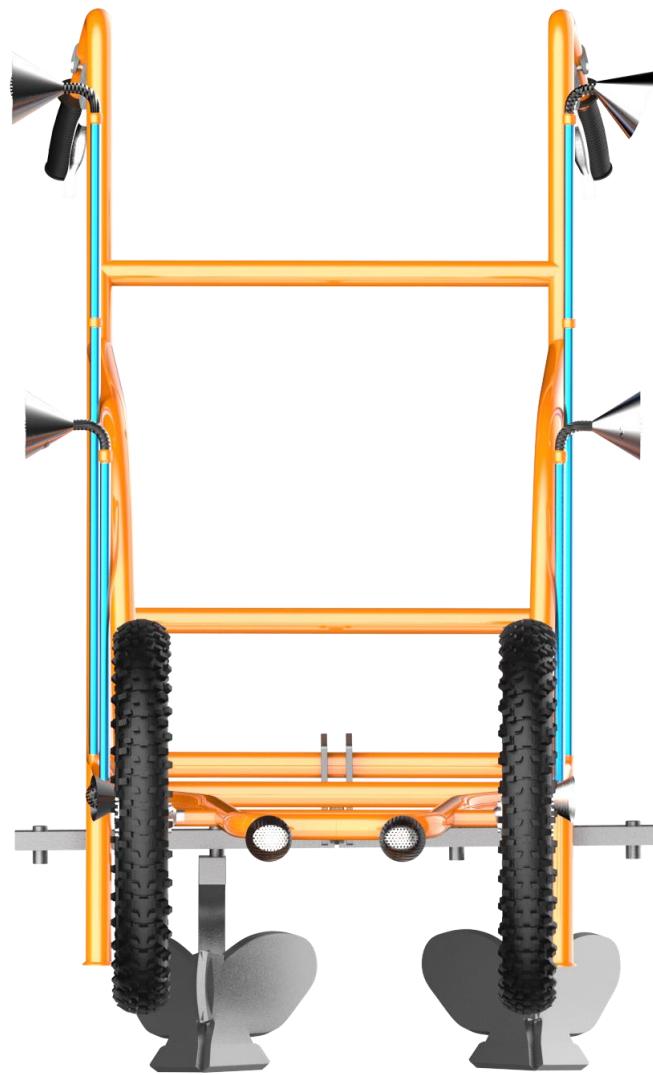
Farmers can control the row size and distance according to crop

3D Model Use case

Adjustable row ridger



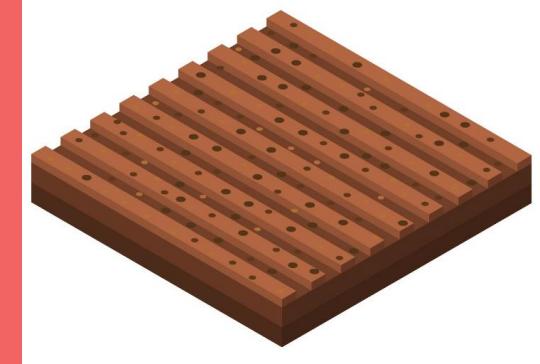
3D Model



3D Model



Sowing in Row farming



**Most of the
farmers grow for
commercialization
and at hence opt
for row farming
for maximum
yield.**



Higher Price in Market



Higher Quality of Yield

Advantages of Row Farming

1.



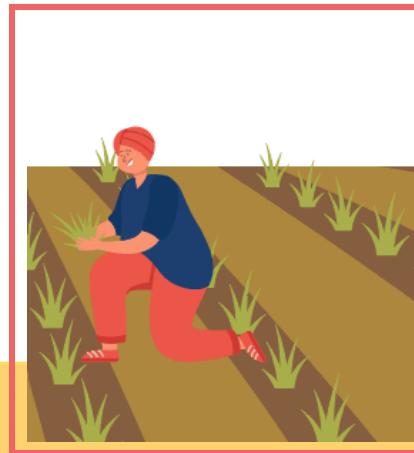
Less Seed Expenses

2.



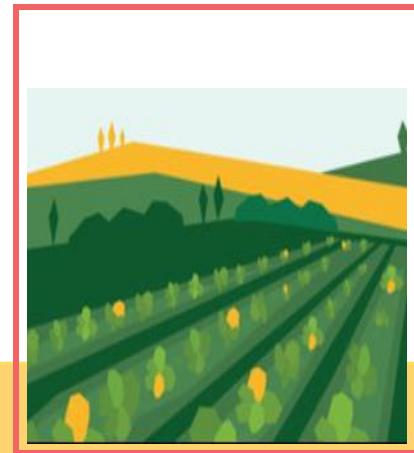
Less Work on Soil

3.



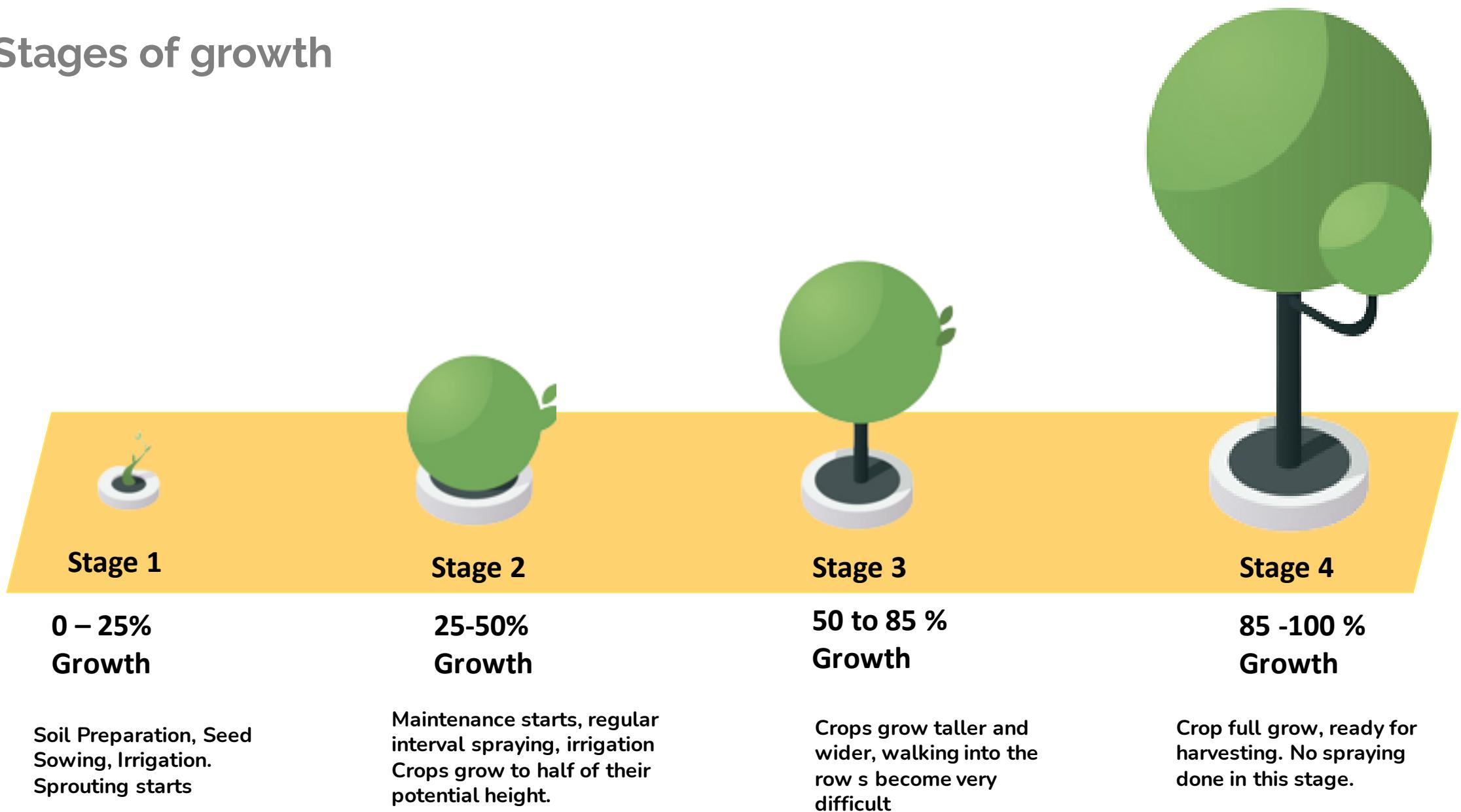
More easy control over Weed between rows

4.

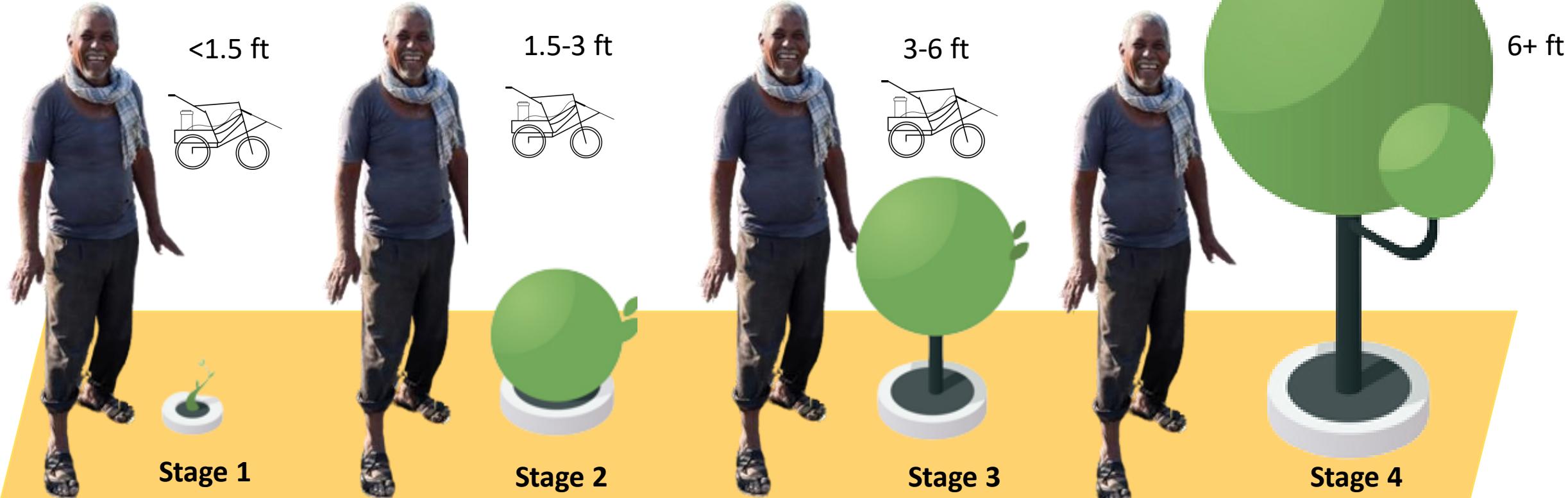


East-West Crop Orientation
(Adequate Sunlight,
Wind & Air)

Stages of growth



Stages of growth



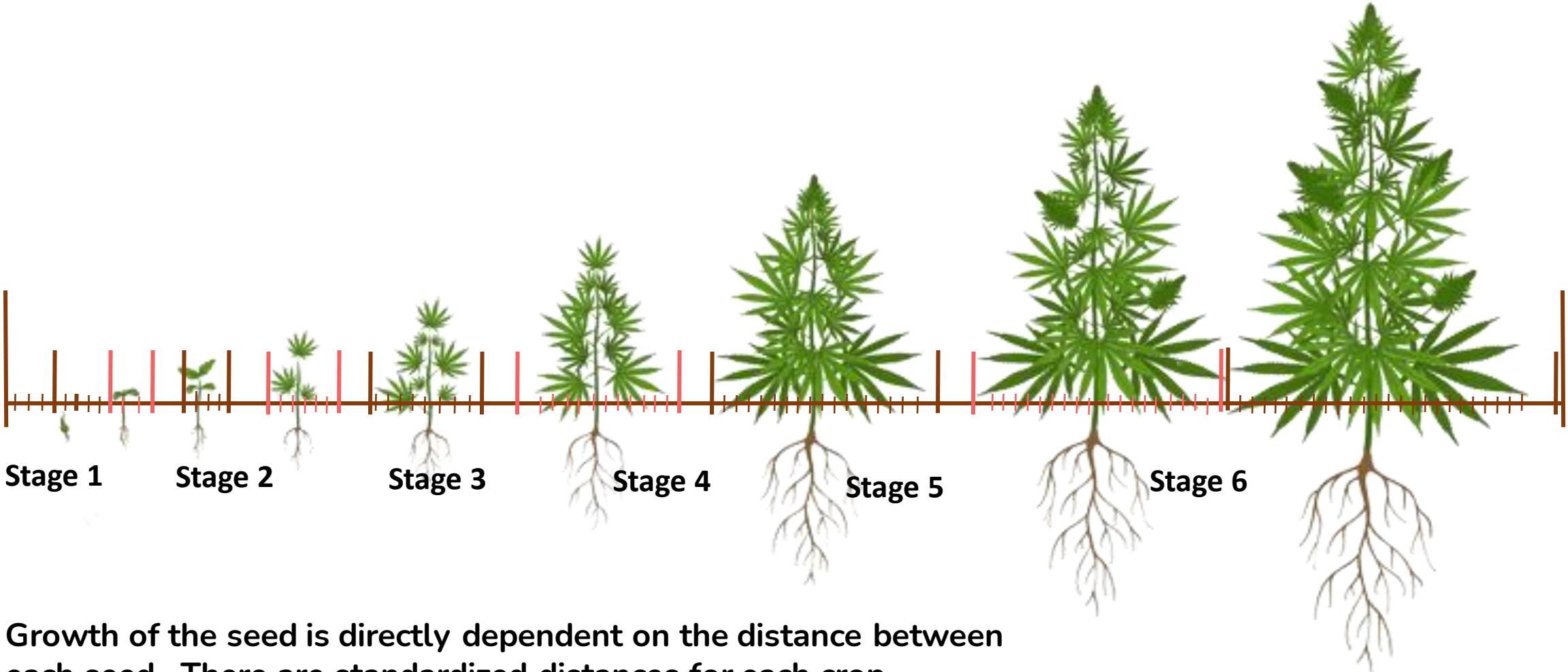
Beetroot
Groundnut
Soyabean

Brinjal
Peas

Lemon
Cotton
Sunflower

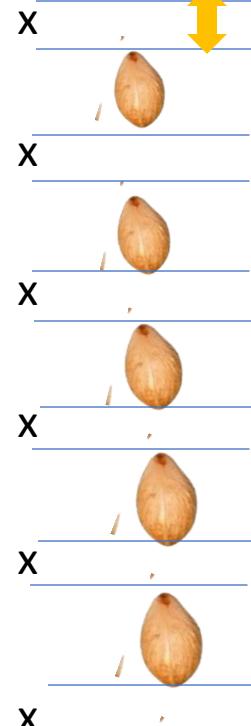
Sugarcane
Maize

Minding the gap is the key



What is done by rich farmers

Advised input



Using



Desired output

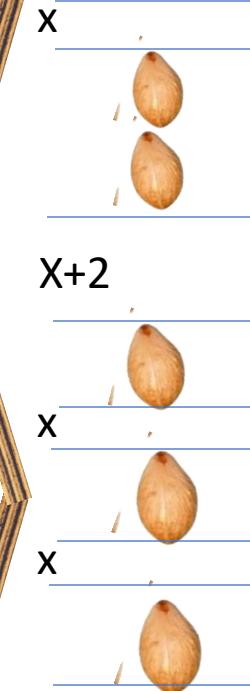


Using high technology machines makes work precise and efficient.

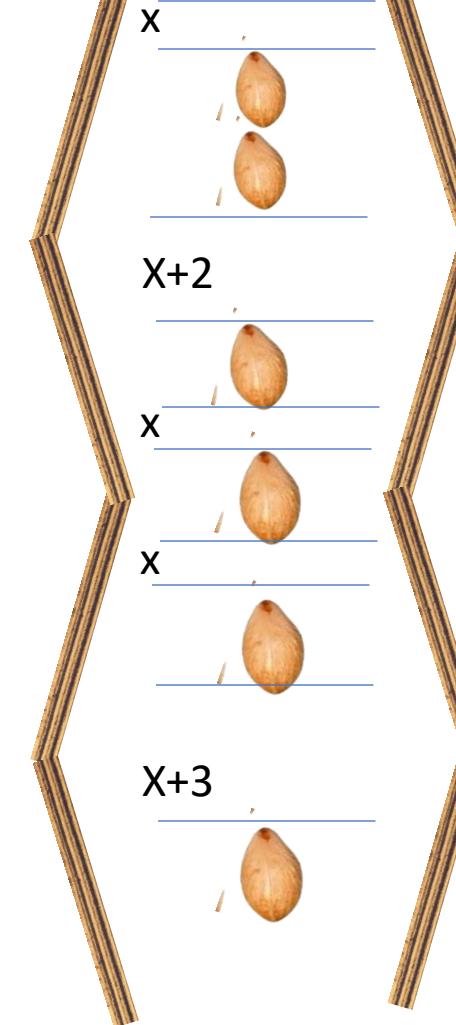
Using advised process of sowing allows proper ventilation of sun light , air and water.
Which plays crucial role in throughout growth of any crop.

What is done by poor farmers

input



X+3



Using



Work done is not precise and

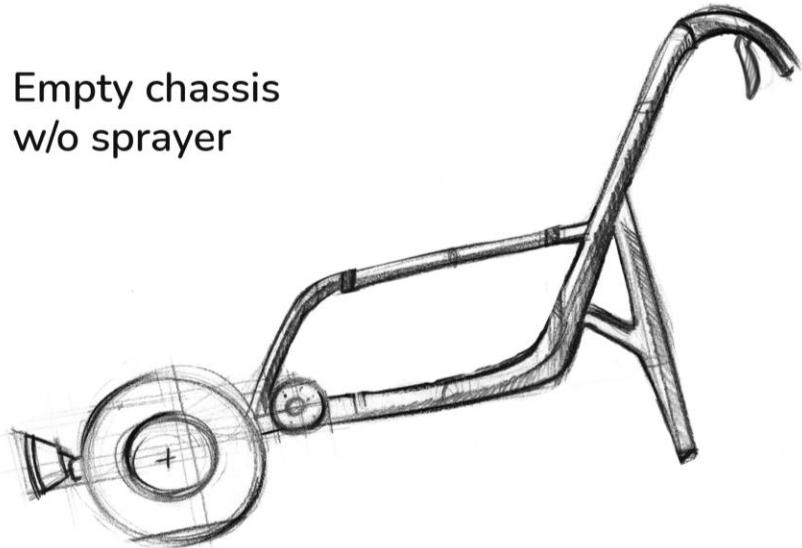
Working is done within time

output

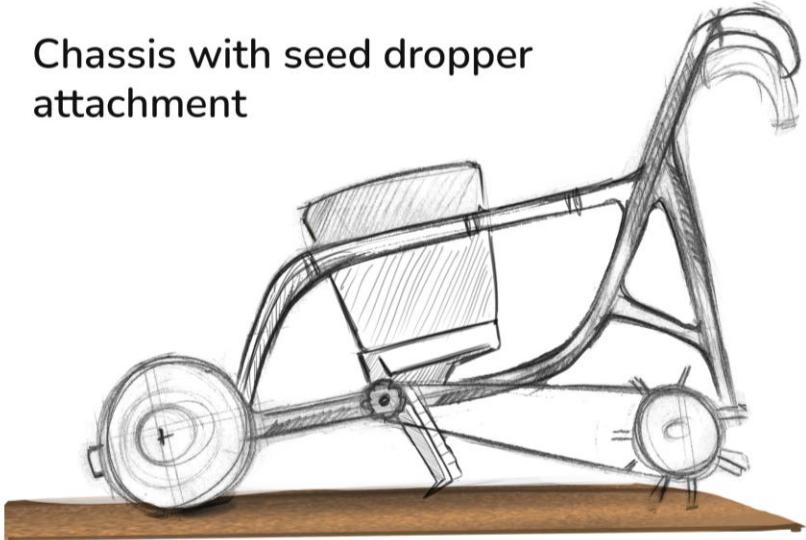


Quantification in Seed dropping

Empty chassis
w/o sprayer

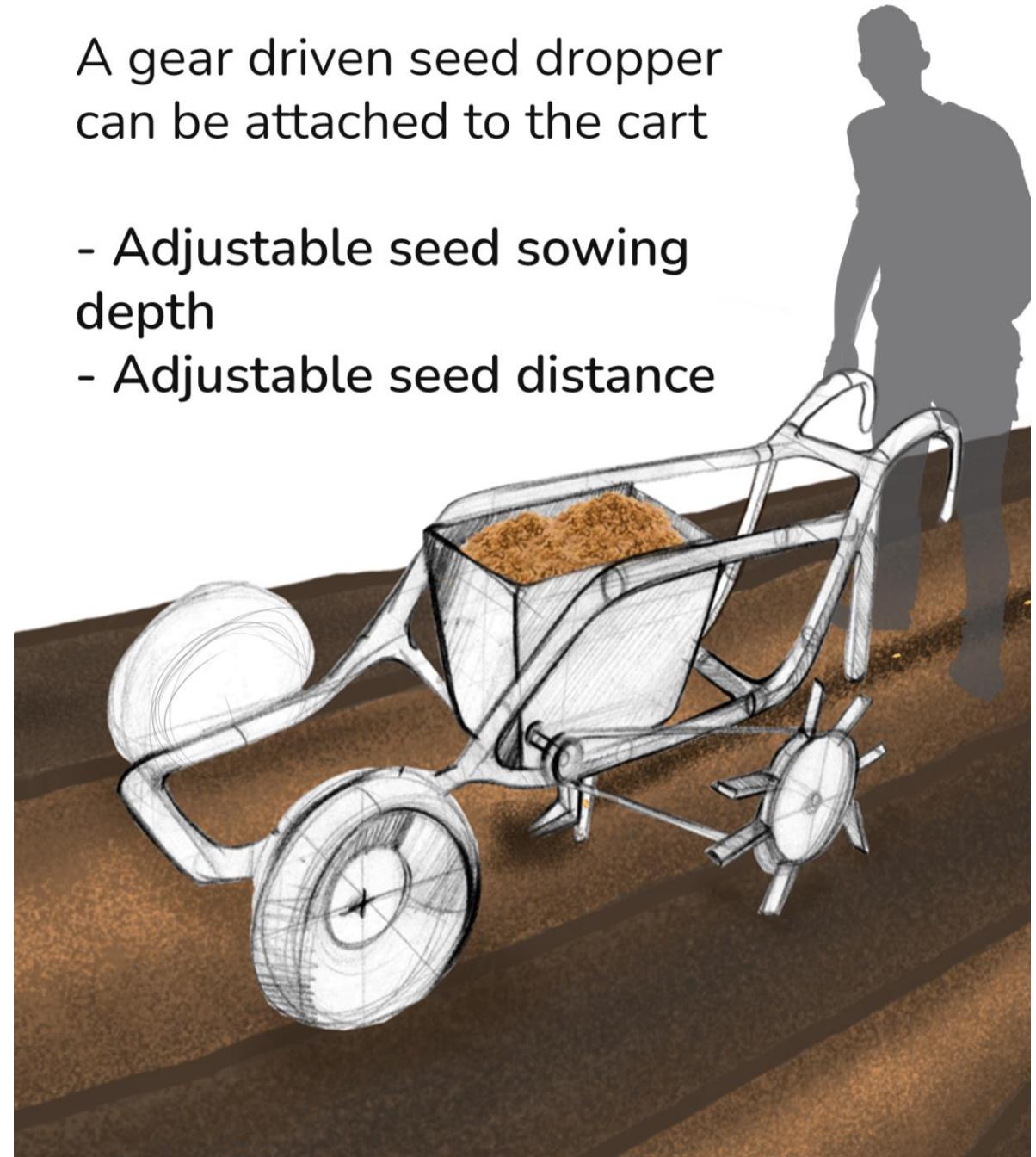


Chassis with seed dropper attachment



A gear driven seed dropper can be attached to the cart

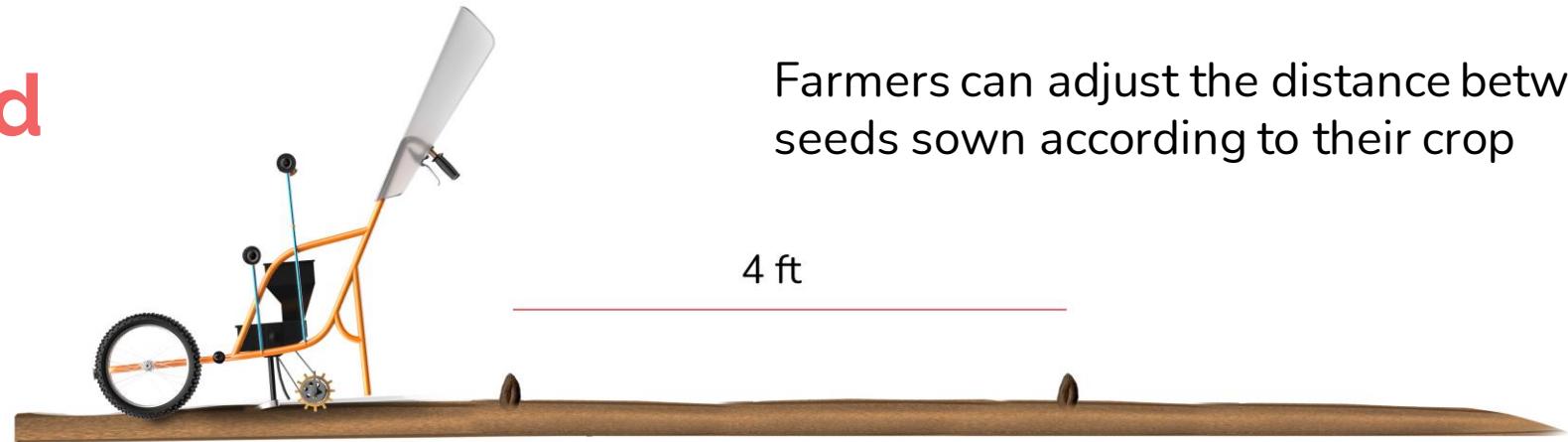
- Adjustable seed sowing depth
- Adjustable seed distance



Adjustable Seed dropper



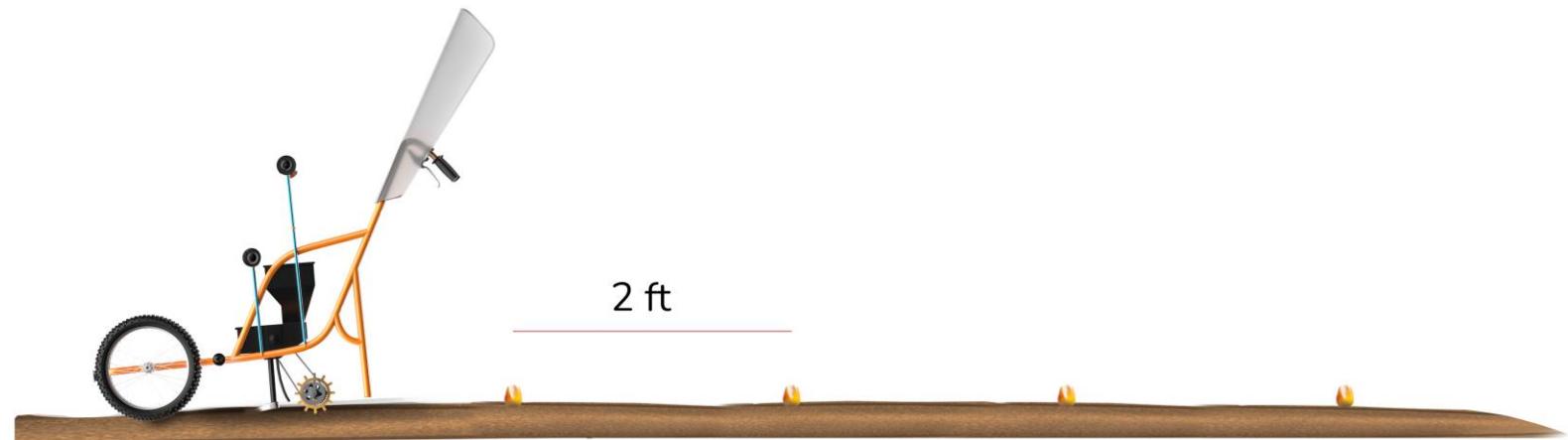
Cotton
Seed distance 4 ft



4 ft



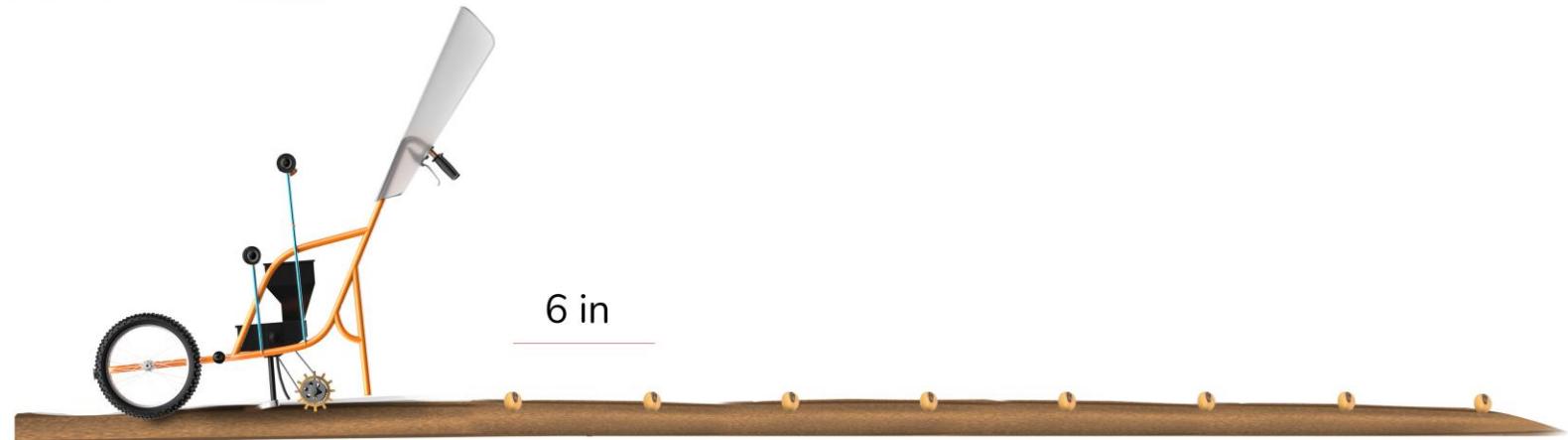
Maize
Seed distance 2 ft



2 ft



Soyabean
Seed distance 6 in



6 in

Farmers can adjust the distance between seeds sown according to their crop

Use case

Adjustable seed
sowing distance-

Sowing seeds at
controlled
distances

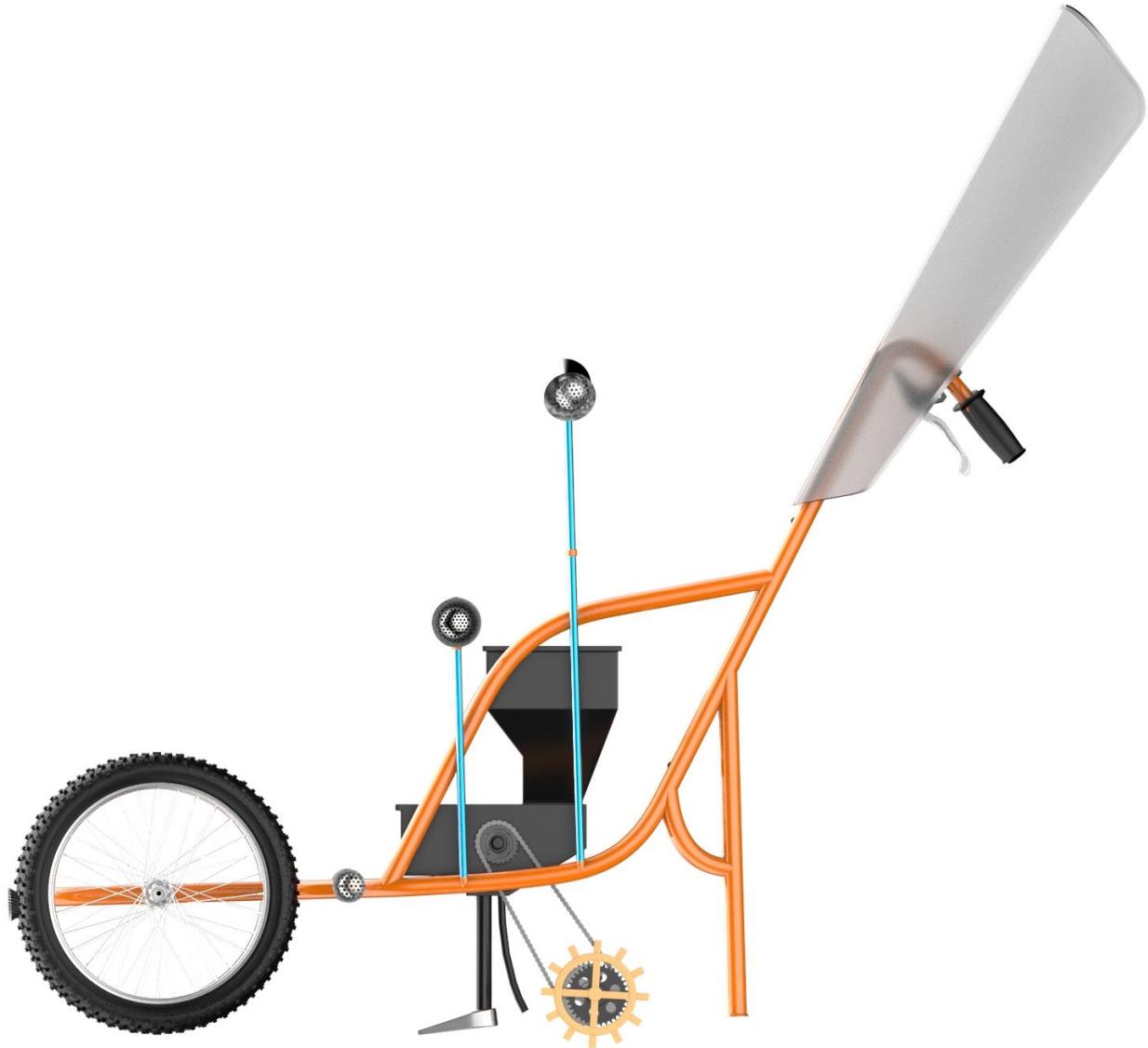
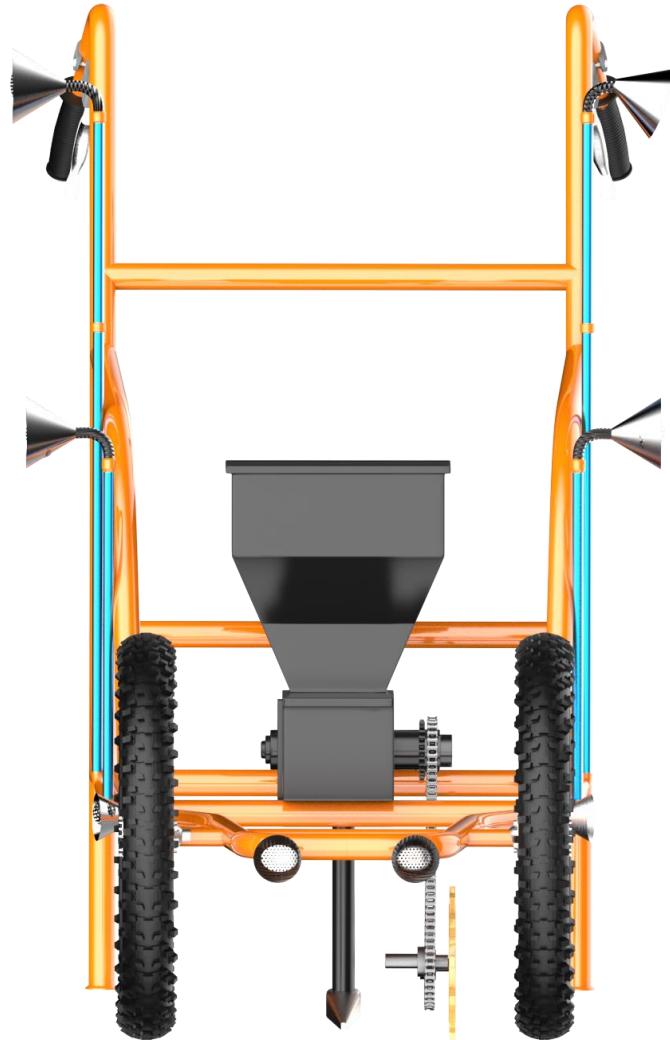


Seed + Fertiliser dropping

Option to Drop
fertiliser pellets
and seeds together
at once during
sowing



3D Model



3D Model



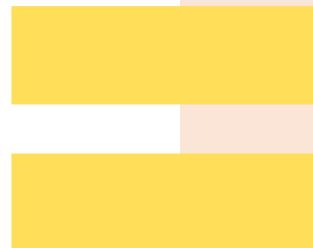
Firefighting using pesticides



Bad weather



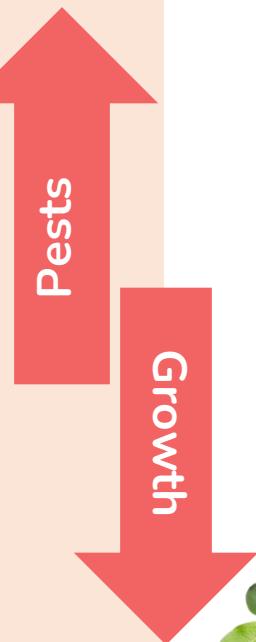
Poor soil manuring



No trees



Weeds



Trees are completely exiting the farm scenario in India.
Planting trees has been constantly promoted by the Indian Traditional farming techniques.



Trees on the edge and in the middle of farms



1. Binding the soil

Trees bind the soil which leads to proper nourishment and makes it porous in nature

2. Protects from pesticides

- Farmers used to put pest repellent trees which would repel pets.
- Neem is the best-known tree for repelling pests.
- The dead leaves from the trees becomes a very good pest repellent.

3. Control wind

Trees also reduces the fluctuation in weather by blocking wind and sun light.

Why Reluctance in using Organic Pesticides



Lack of Good Soil

Heavy pests come in which cannot be removed by organic sprayer



Lack of Trees

Good organic pesticide requires good sourcing of leaves

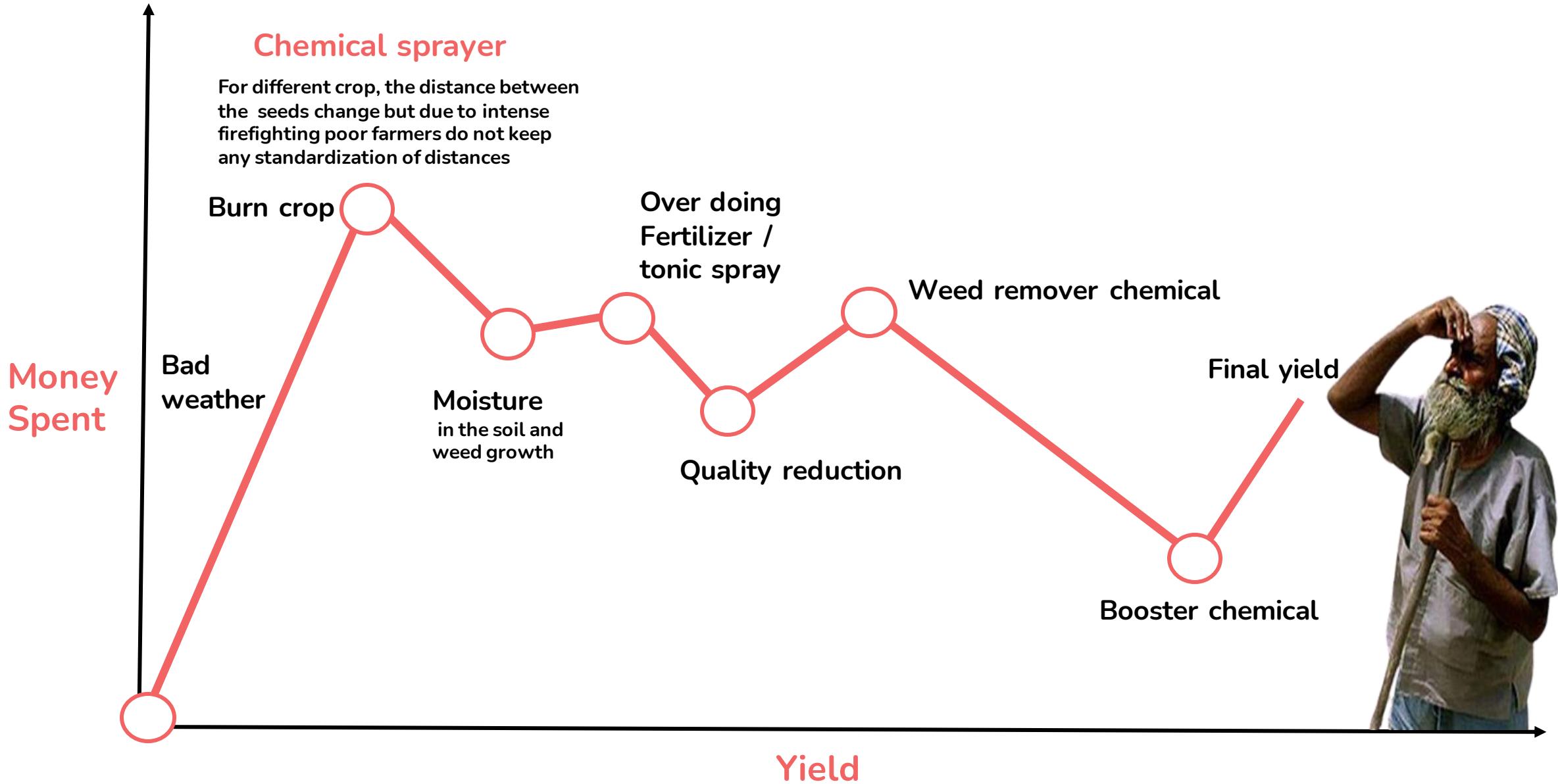
- Good organic pesticide requires good sourcing of leaves.
- Need to be sourced from 4 different places.
- The trees are not available in the nearby farm, or someone must source it by travelling huge distances



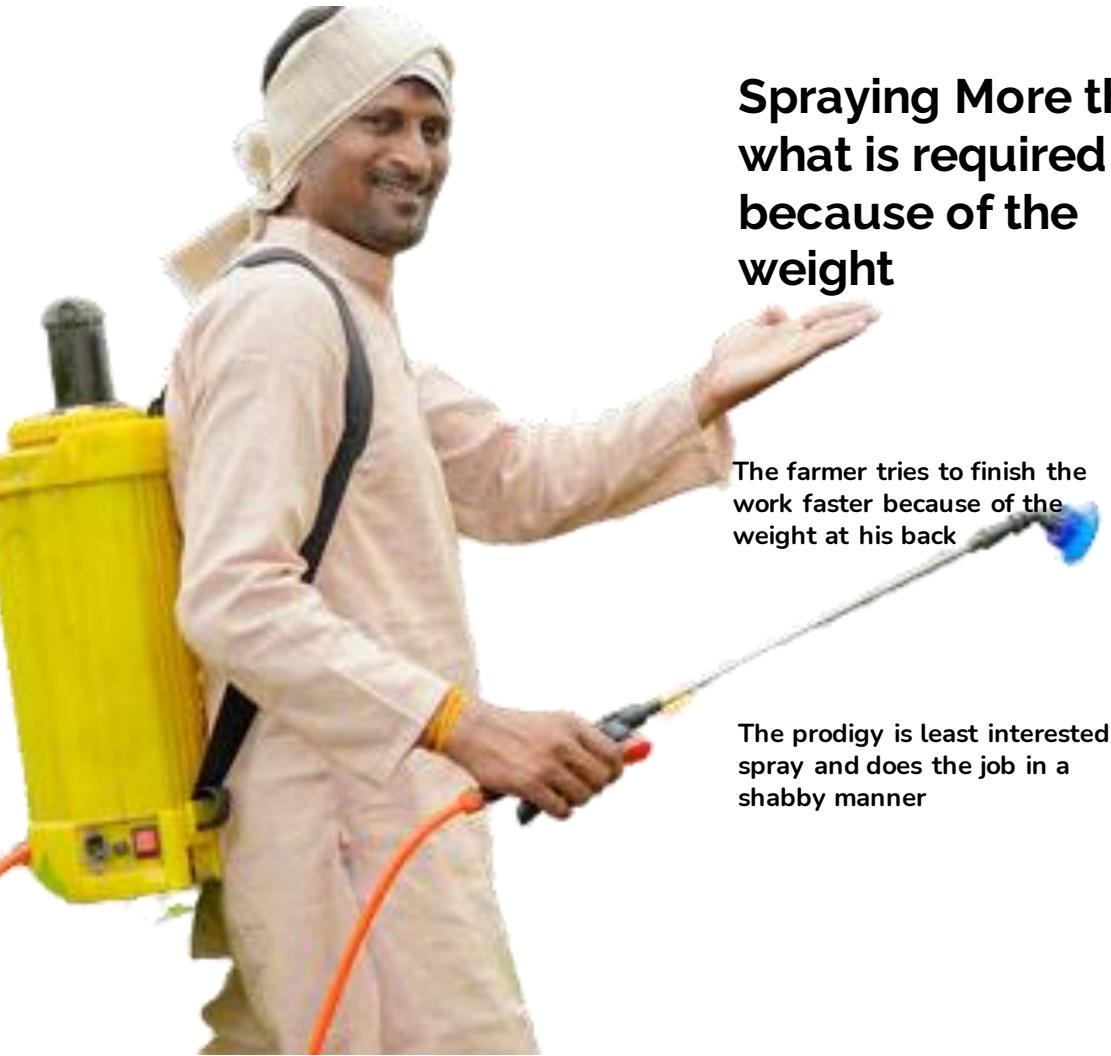
Lack of Capital

Good organic pesticides costs much more than chemical

How Poor Farmers Maintain their Crops



Firefighting through pesticides



Spraying More than what is required because of the weight

Not sure if the pesticide has reached the crops adequately

Sometimes the farmer is not sure has the pesticides reached the crop.

They keep spraying more and more

Sometimes bending is required but most of them can't bend. Till some stages it's important to bend.

Not trusting the existing products in the market



The product is a value engineered product of a bigger model

Huge wastage of pesticide

1. Empowering farmers with Organic Pesticide

1. Collection of various pest resistant leaves from KG network



2. Warehousing & packing into a DIY kit



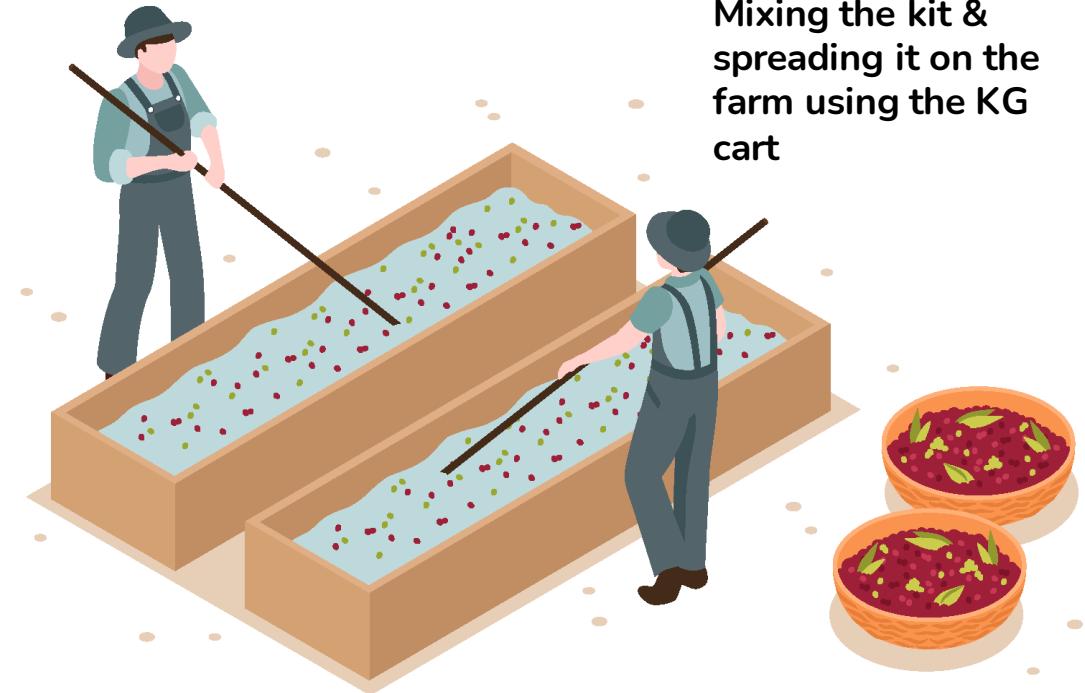
3. Delivering it to the farmer ready to be used by the cart



DIY Organic Pesticide Kit



DIY kit containing
The natural pesticide
mix



Mixing the kit &
spreading it on the
farm using the KG
cart



2. Reducing Pests

DAY



Pheromone attractants



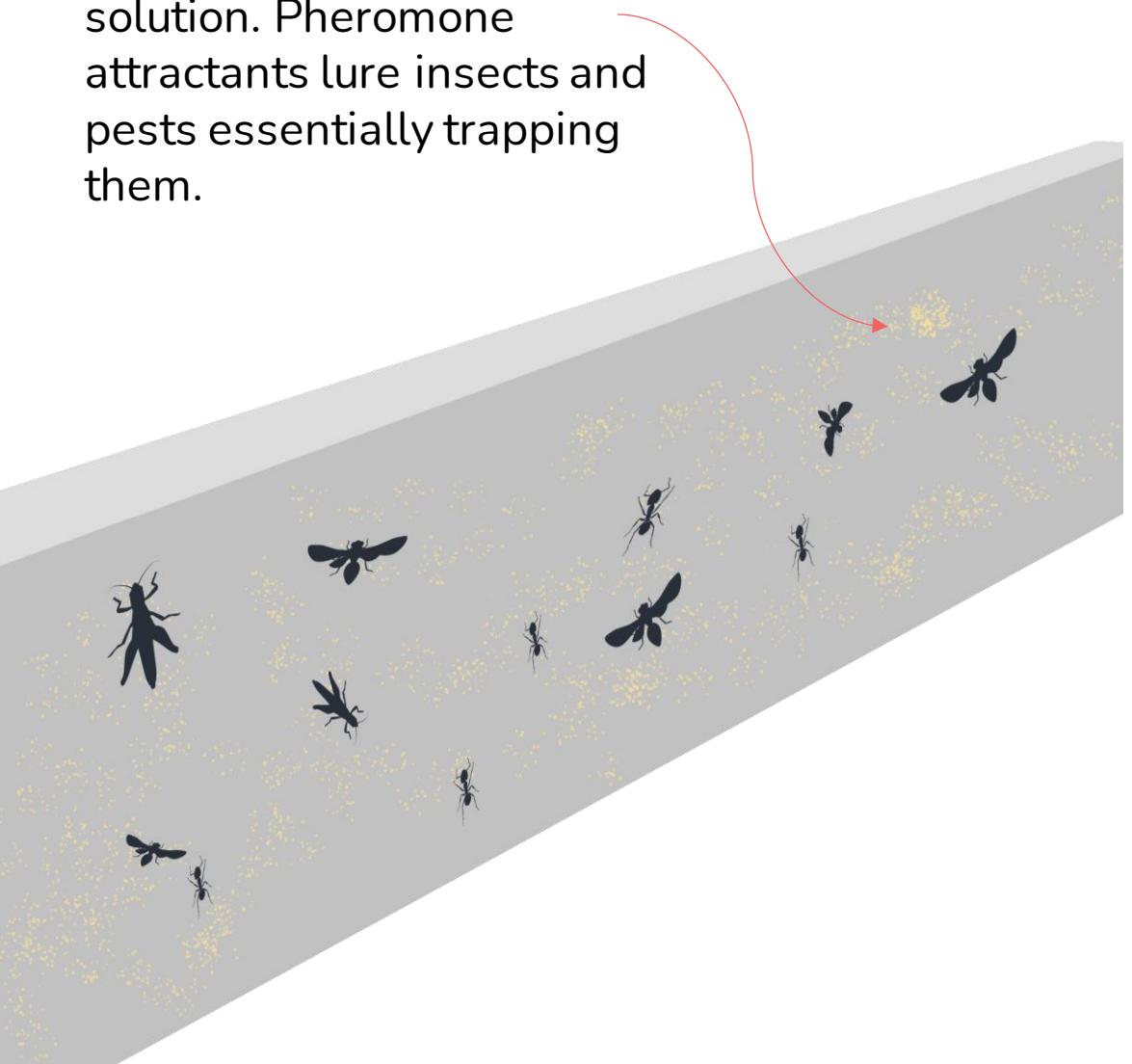
Fencing around the farm sprayed with a natural solution (like nectar) that attract pests. This will prevent the pests from entering the farm by trapping them on the fencing.

NIGHT



Attracting nocturnal insects with a source of light around the fence.

Pheromone attractant solution. Pheromone attractants lure insects and pests essentially trapping them.

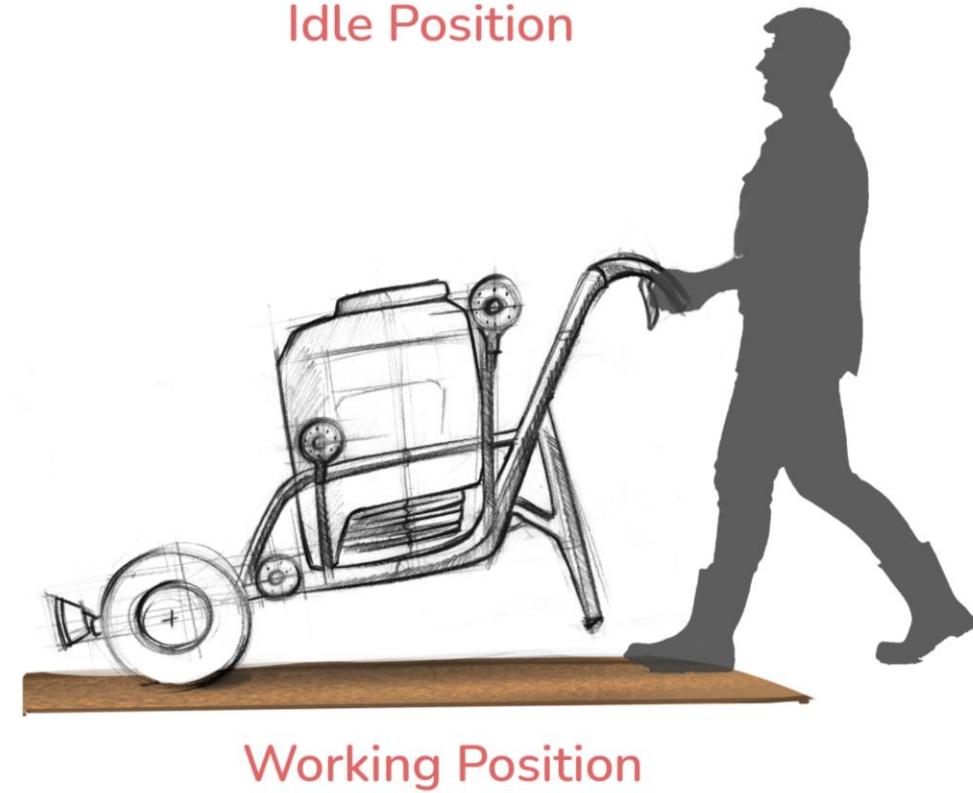
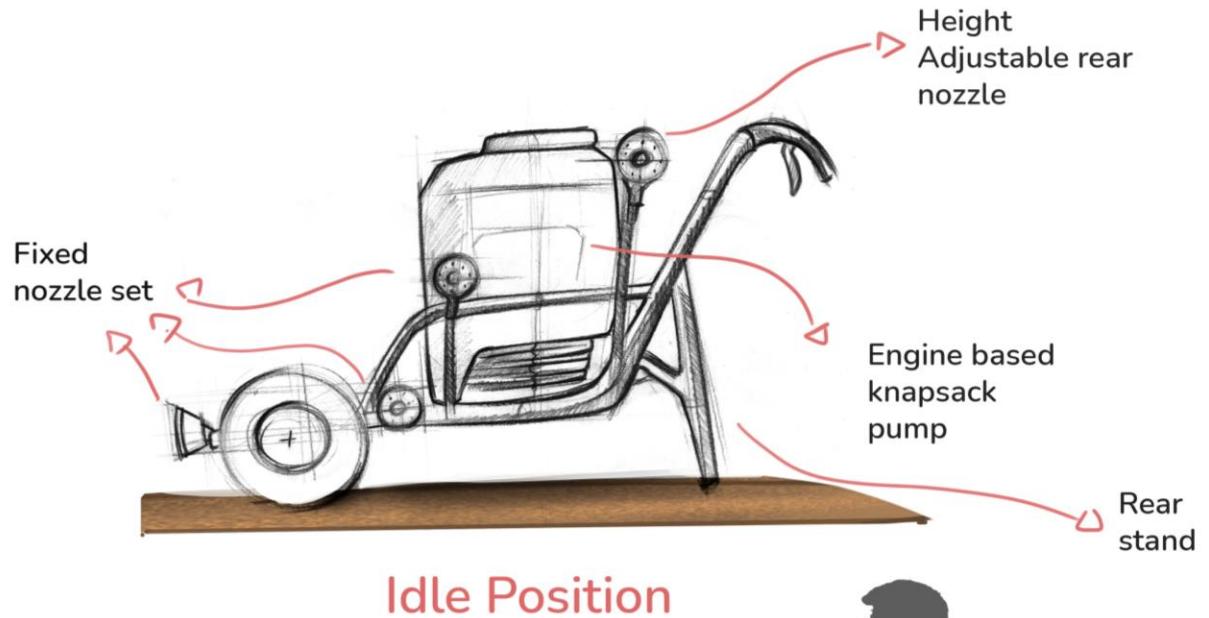
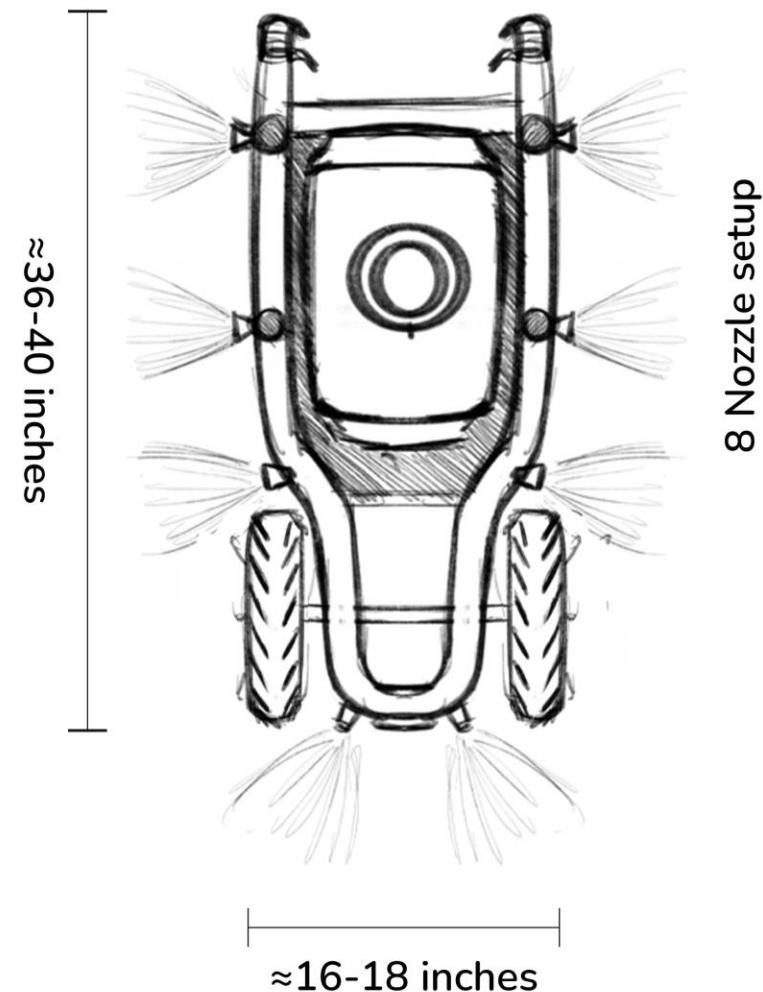


3M Scotch Lite reflective material.
This reflective material glows in the dark, disorienting and attracting nocturnal insects and pests.

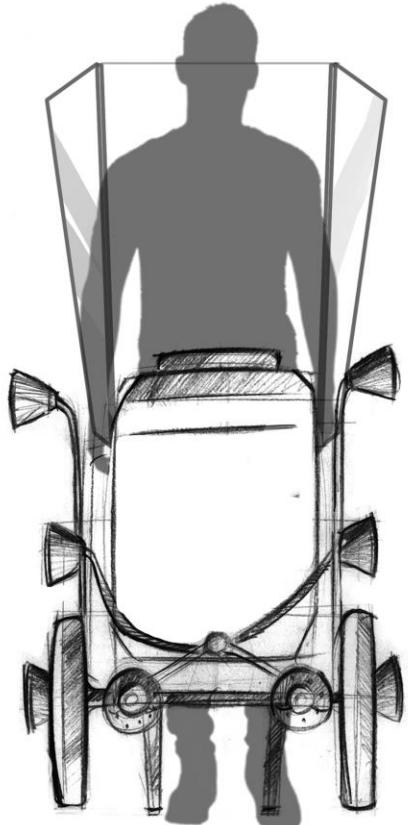


3. Pesticide Sprayer

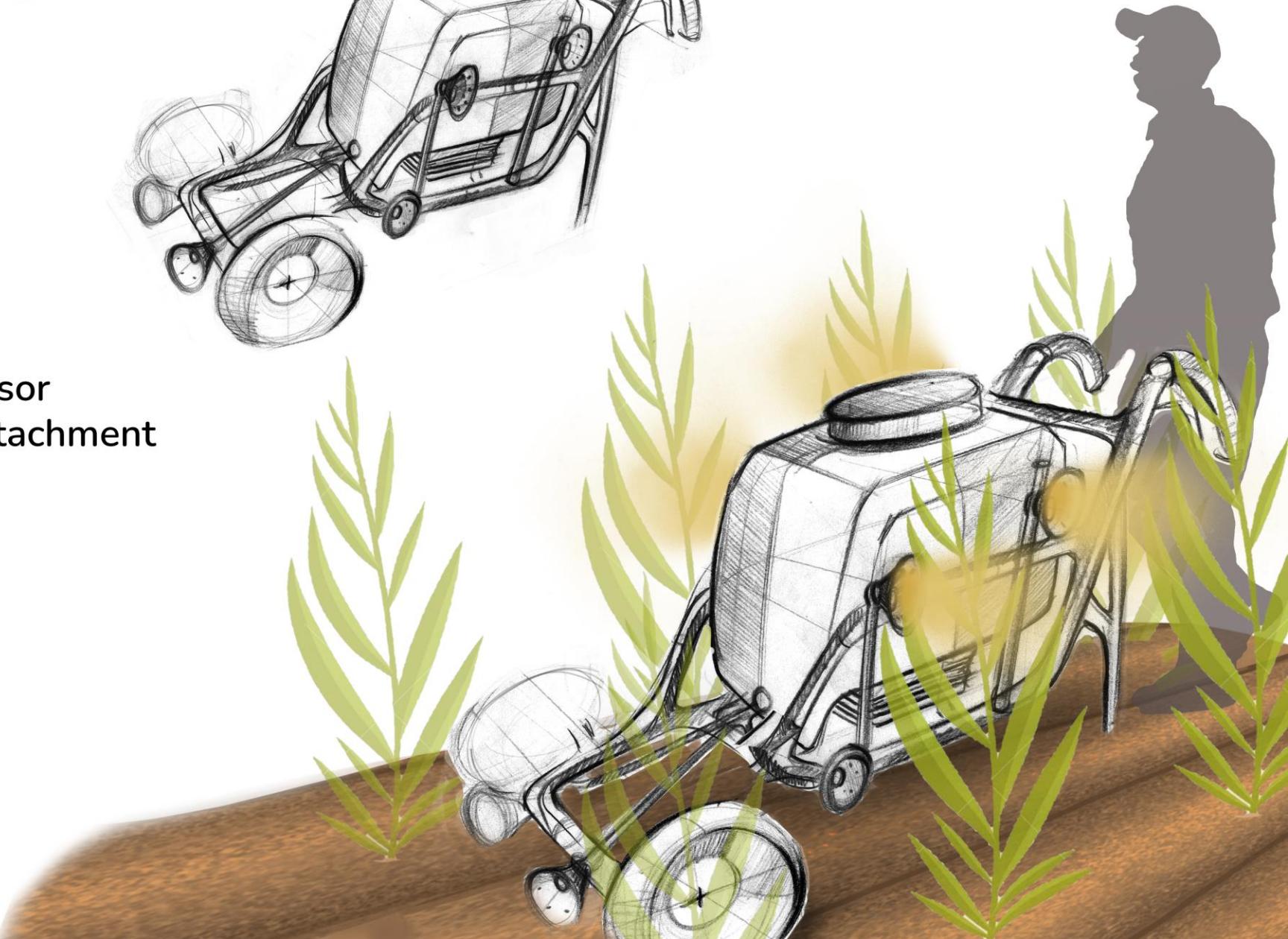
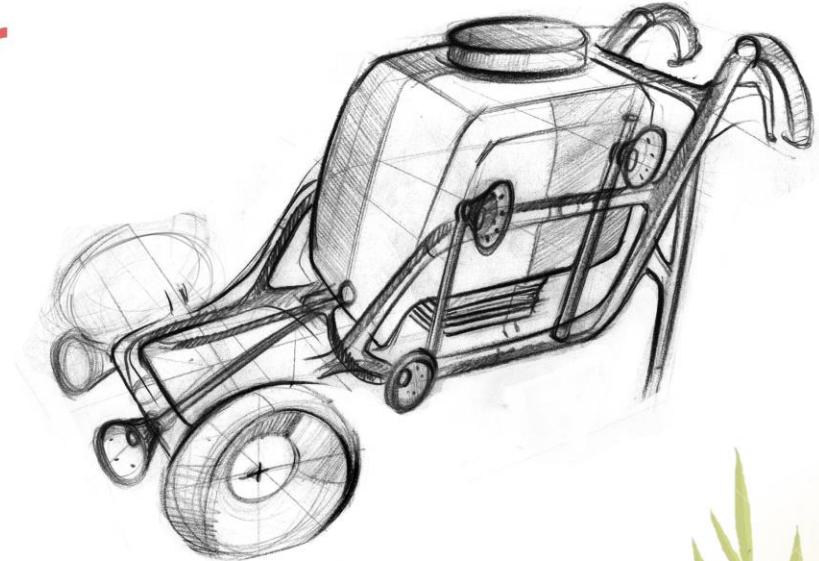
Top View



Pesticide Sprayer Use Case

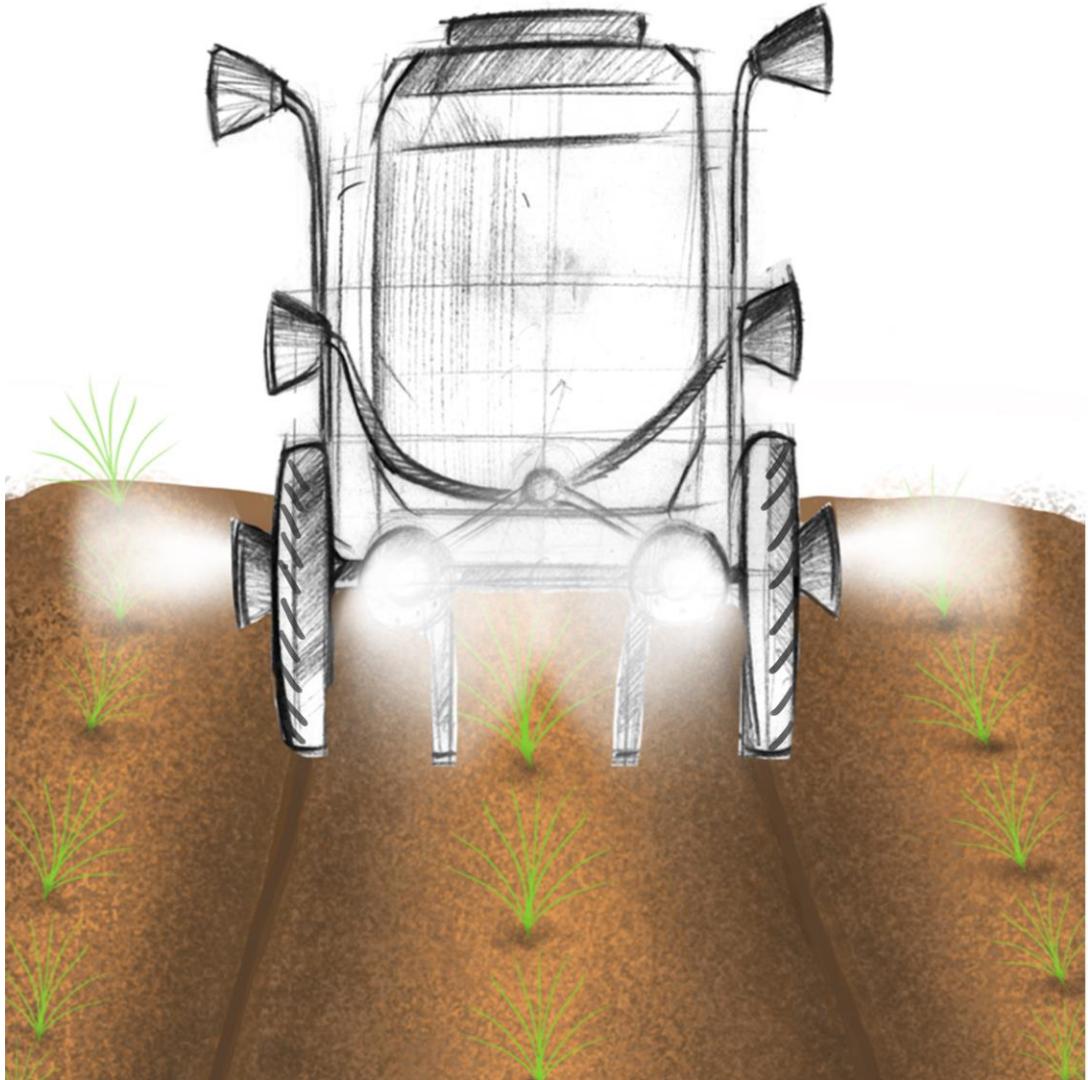


Visor
attachment

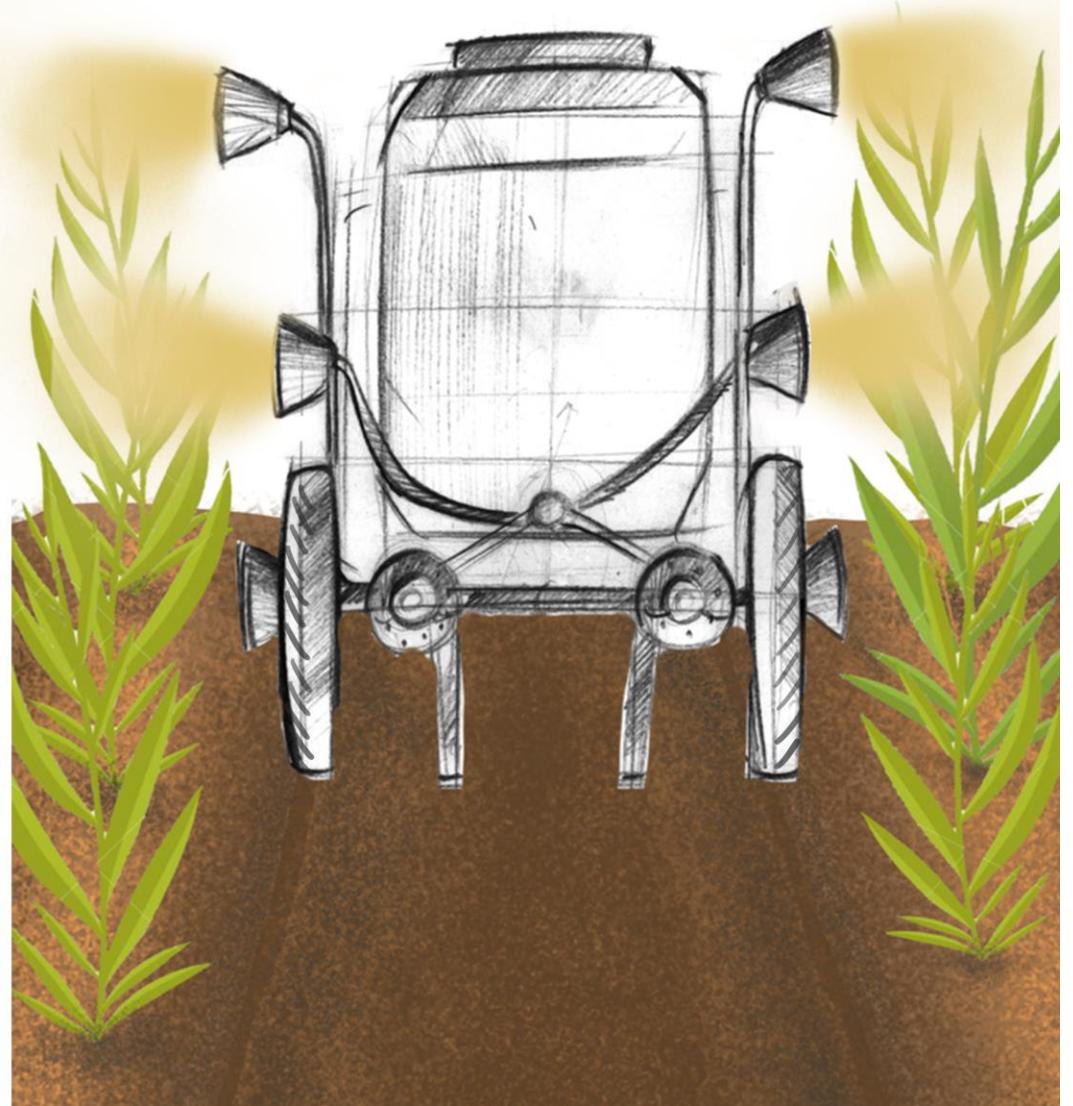


Pesticide Sprayer

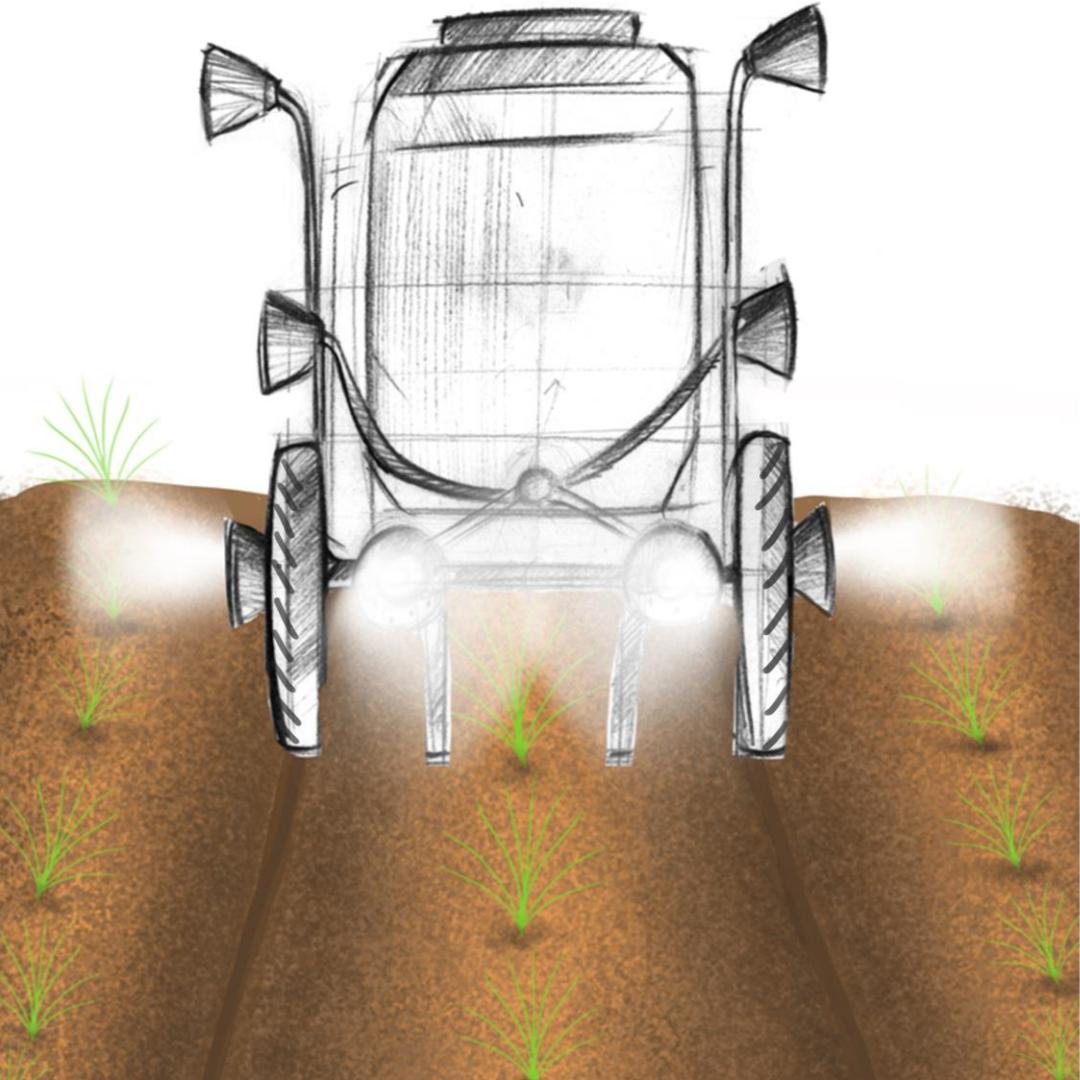
Spraying in Small crops
with rows closer



Spraying in medium
sized crops

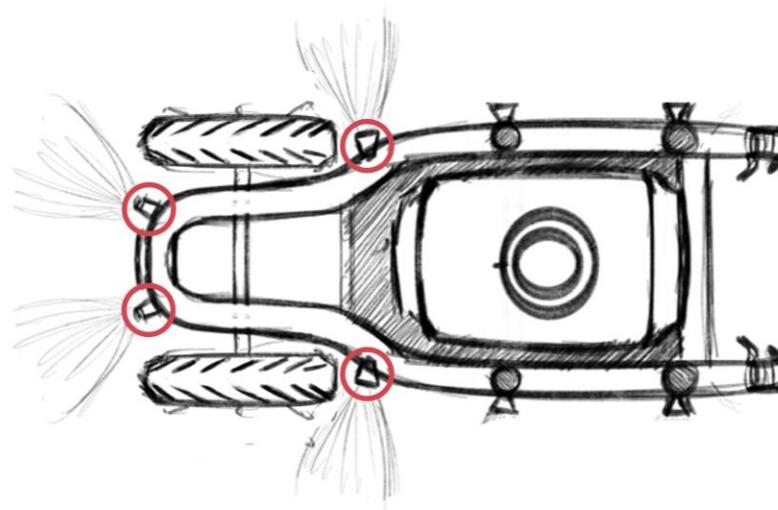


Pesticide Sprayer



Spraying in Small crops with less distance between rows

Front 4 nozzles are activated for precise spraying

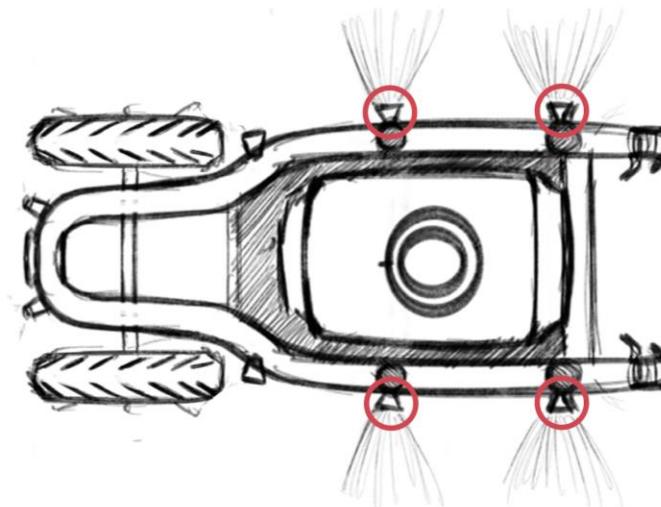


Pesticide Sprayer



Spraying in medium sized crops
with spaced rows

Rear 4 nozzles are activated for
fully covering the crop

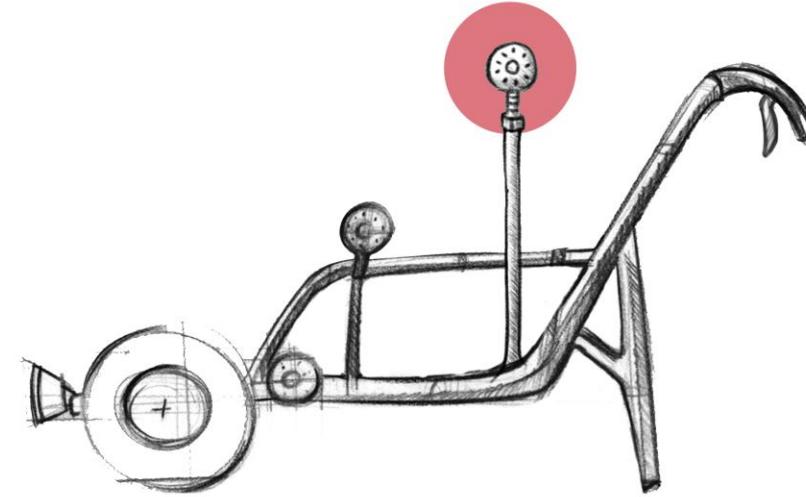


Pesticide Sprayer



Rearmost nozzle is height adjustable.

The nozzles neck angle is also adjustable to accomodate varied sizes of crops



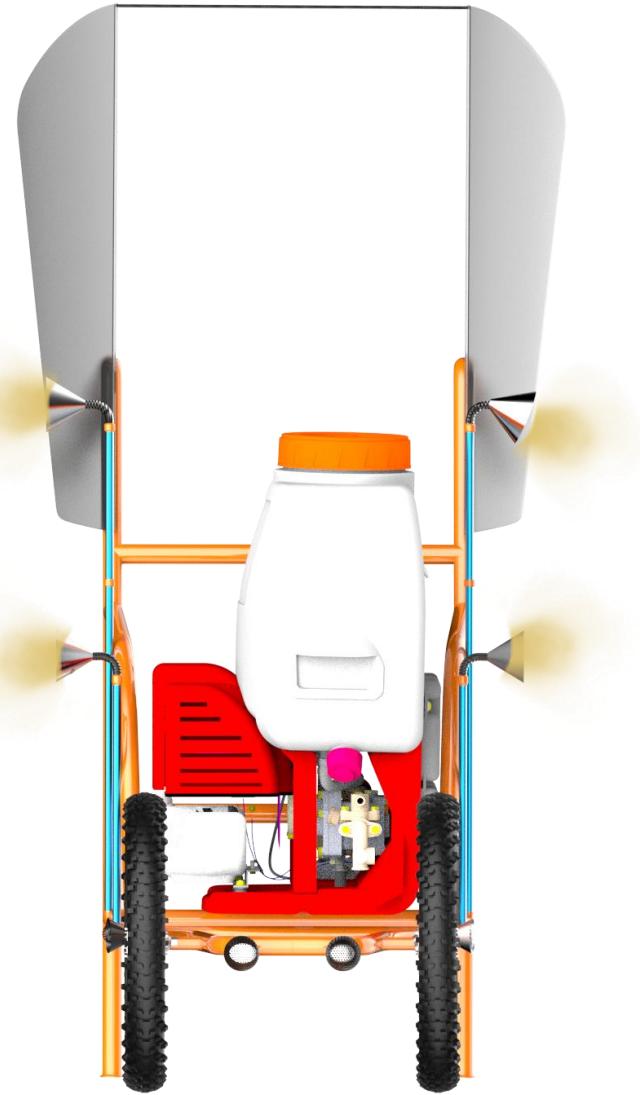
Adjustable neck can spray crops from top or side



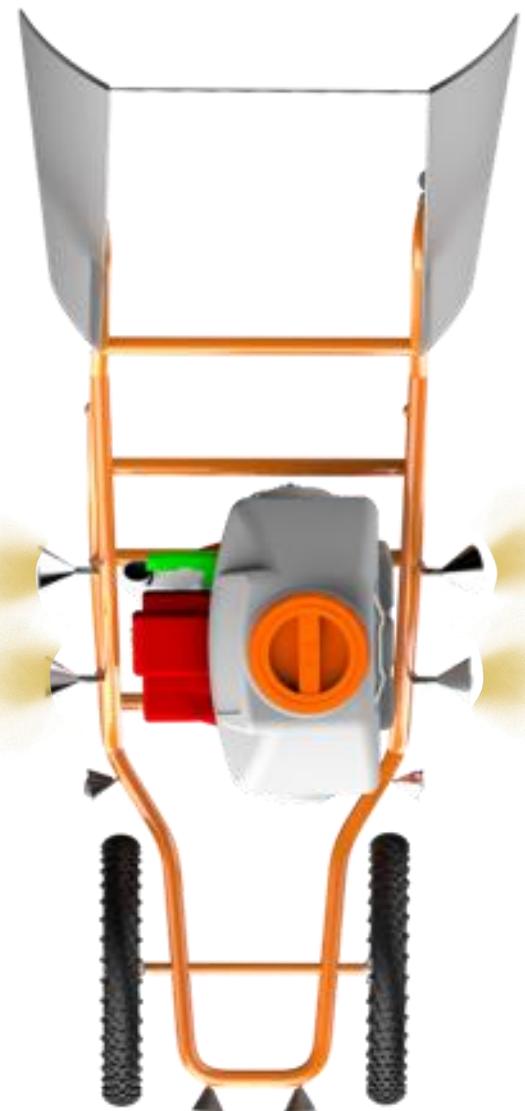
3D Model



3D Model

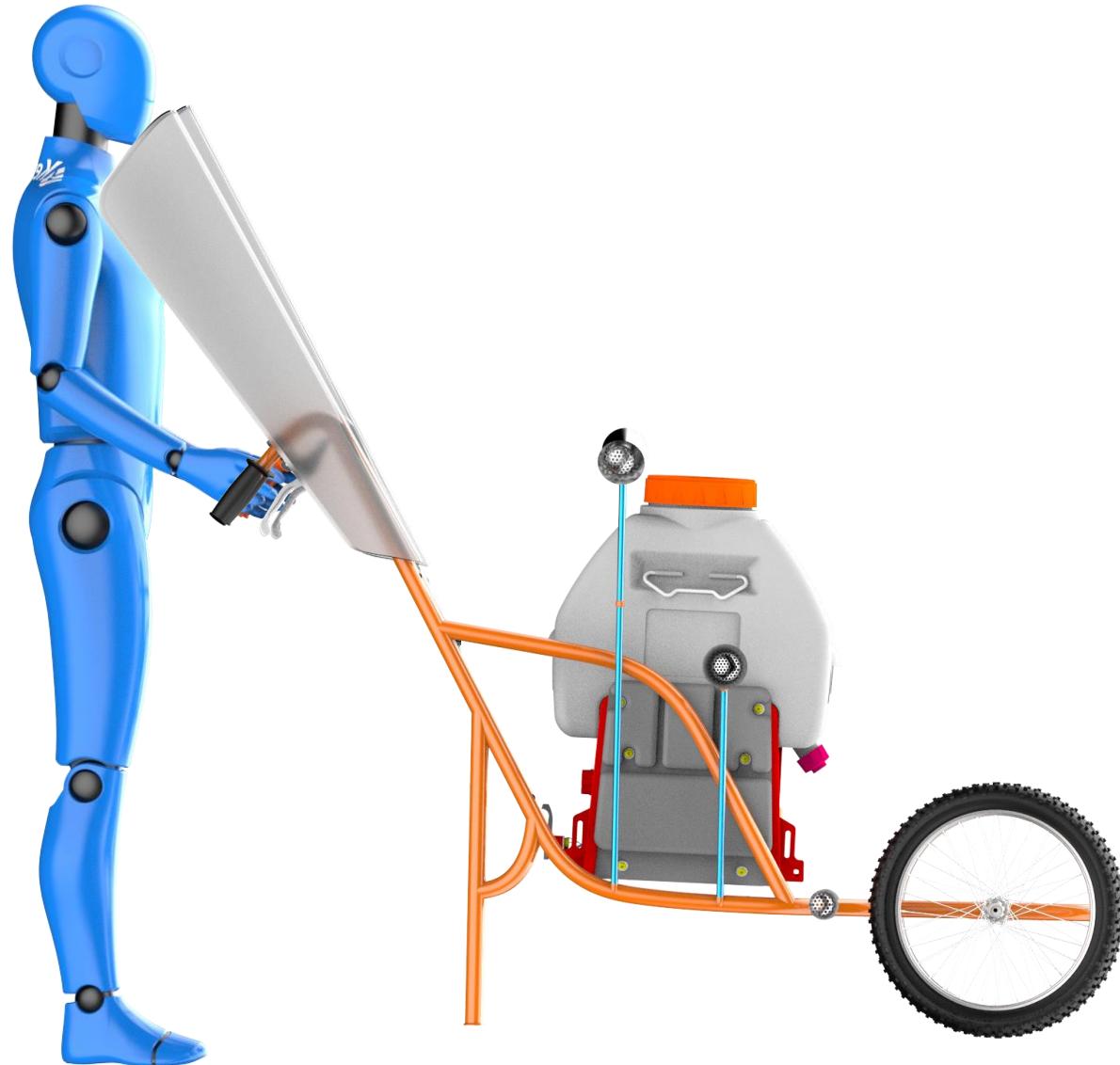


3D Model



3D Model

Scale reference
Average Male height
5'5"



3D Model in scenario



Alternate source of income after Harvesting



Three phases of Harvesting

1. While Harvesting



2. Post Harvesting



3. Post harvest service



1. While Harvesting



- Usually, 2 people are required while harvesting the crop wherein 1 person holds the sack & another harvests the crop & fills it in
- The labours carry the sacks full of produce on their back to where the produce can then be distributed from

Labour
Intensive

Too
much
Effort

Cart as an Easy Transport Solution

- The cart can be used to keep sacks while harvesting the crop reducing the labours required
- Hooks in the rear enable one person instead of 2 to fill the sacks efficiently



2. Post Harvesting

Demand



Supply



Yield gets spoiled

Don't get enough return

- Due to Mono Crop Farming, the Supply is more than the demand
- The farmers wait for long time to get their expected prices for the produce



**Spoilage of
yield**

KG community truck for market sale

- KG Agrotech truck will go to the farms and collect the produce of a group of farmers.
- Live Market rates of the nearest 3 markets displayed, from which the farmer community can decide where to sell their produce
- Empowers farmers to sell at good rates and compete with large farmers.



3. Post Harvest Service



Waiting for
the right
price,
farmers
don't sell
the produce

No storage
facility
available to
them for
stocking

Budget
stress due
to
inadequate
returns on
produce

Investing in
extra
infrastructur
e &
resources is
expensive

1. Value Addition to Yield (post processing)

**WHY WASTE
WHEN WE CAN PROCESS?**



ADDING VALUE TO ONION WASTE



- PEEL POWDER
- DEHYDRATED ONION FLAKES
- STALK POWDER
- VACUUM PACKED PEELED ONION
- ONION PASTE

1. Putting a percentage of stock to another use

3. Connecting with potential buyers like hotels, caterers, food factories, etc who will buy the produce

2. Eg: Making & selling Easy Aachars or dry powders of the produce



1. Post Processing As a Solution

1.Extra yield

2. No storage available

3. Post processing solutions

4. Selling the processed product

5. Alternate source of income

"If we can give 10 % post possessing ability to our average to poor farmers, we can bring them to minimum wage level and bring them away from one source of income"



Sr. Scientist-Head KVK-1 Sultanpur

2. Providing a source of alternate income



Marigold



Chilli



Okra (Bhindi)

A system of Hydroponics that can be rented from KG Agrotech

1.
Vertical Hydroponics that can be set up on the exterior boundary of the farm

2. Growing Cash Crops that grow in a small span of time

Farmers get alternate income from crops who are always in demand

Summarizing Proposed Solutions

1. Tackling Soil Exploitation

3 Strategies-

1. Raw manure kit delivered to farmer
2. 'Activated soil' delivered to farmer
3. 'End to end' manuring solution



2. Manuring attachment



2. Problems with Soil Preparation & sowing

1. Leveller attachment



2. Row ridger attachment



3. Sowing attachment



3. Firefighting using pesticides

1. DIY organic pesticide kit



2. Pest Boundary solution



3. Pesticide Sprayer



4. Harvesting, storage and sale

1. Efficient Harvest & store solution



2. KG Community sale truck



5. Lack of alternate sources of income

1. Post processing



2. Rental Hydroponics model



Our previous presentation

Crop selection





“ I invested 2 lakhs
on pomegranate,
and I could not
grow it properly.”

Story of pomegranate



Soil Testing



Market Study



Forecasting Maintenance



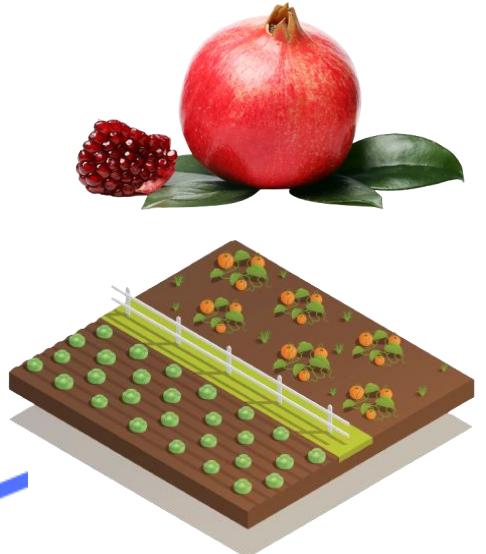
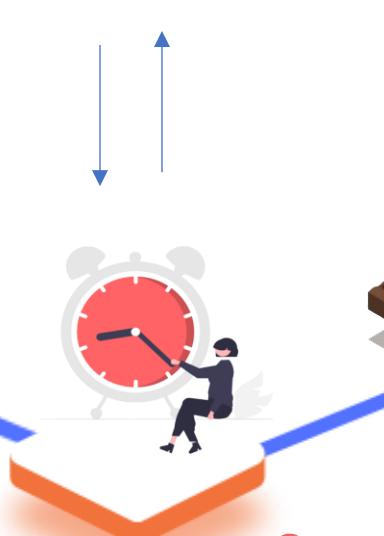
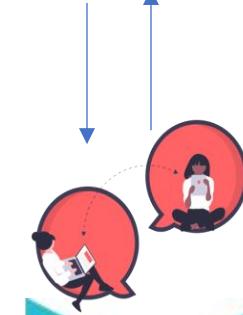
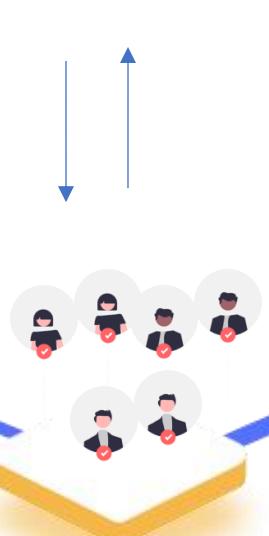
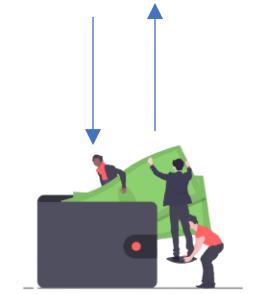
Government Recommendation

Spends money to get testing done for better understanding soil and crop to be grown

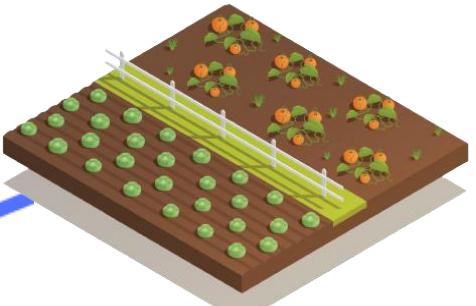
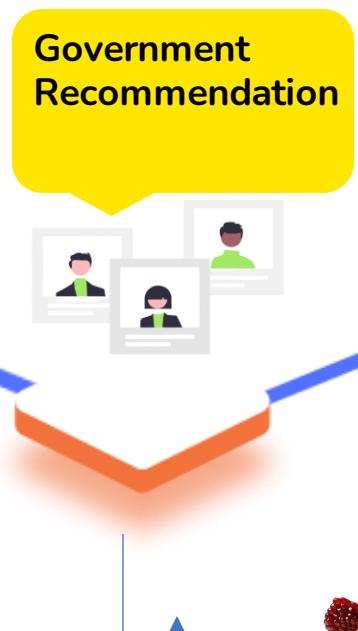
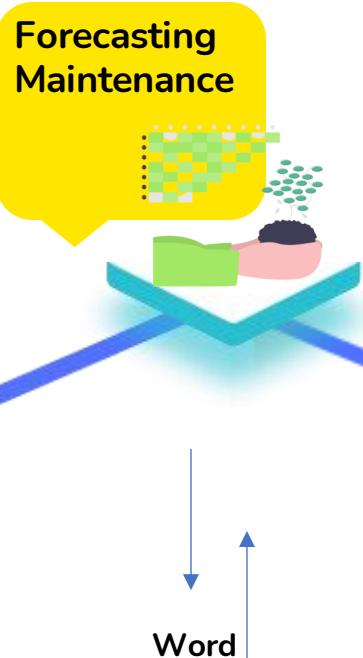
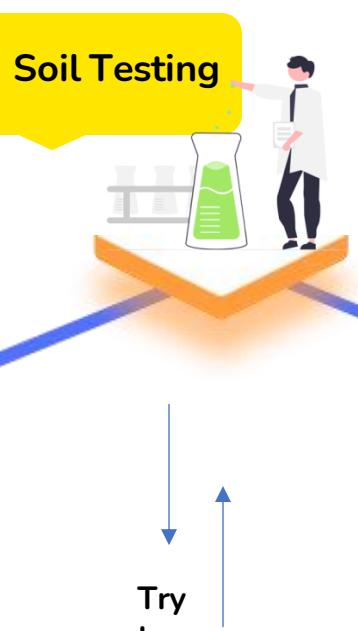
Invest time understanding current market situation for clever crop selection

Patiently understand analysis data by experts which are broadcasted on AIR

Always keen to learn and explore something new, as they have risk taking abilities



Good yield of pomegranate



Saves money
for future
expenses



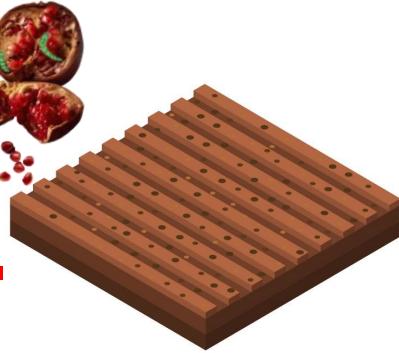
Copies other and
big farmers steps



Trust his
capabilities through
past experiences



Never
interested in
trying something
new



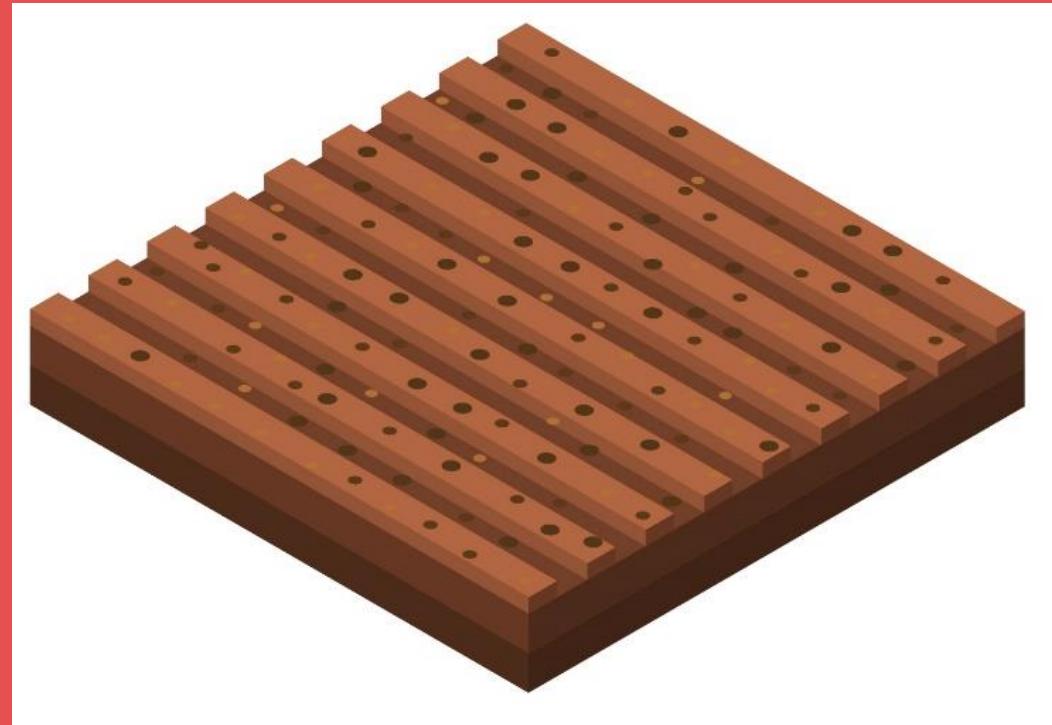
Bad yield

Future scope for KG Aggrotech

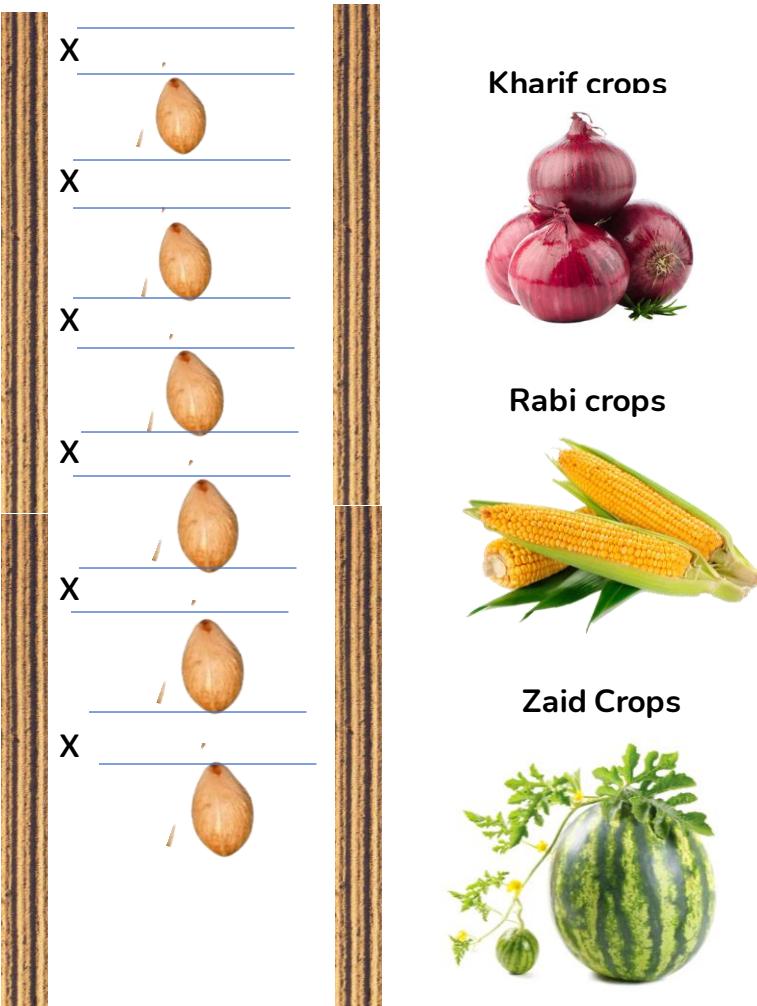


**Empowering farmers through right measurement and quantification
Enabling informed crop selection and farm systems management.**

Seed Sowing



Different crops and distances



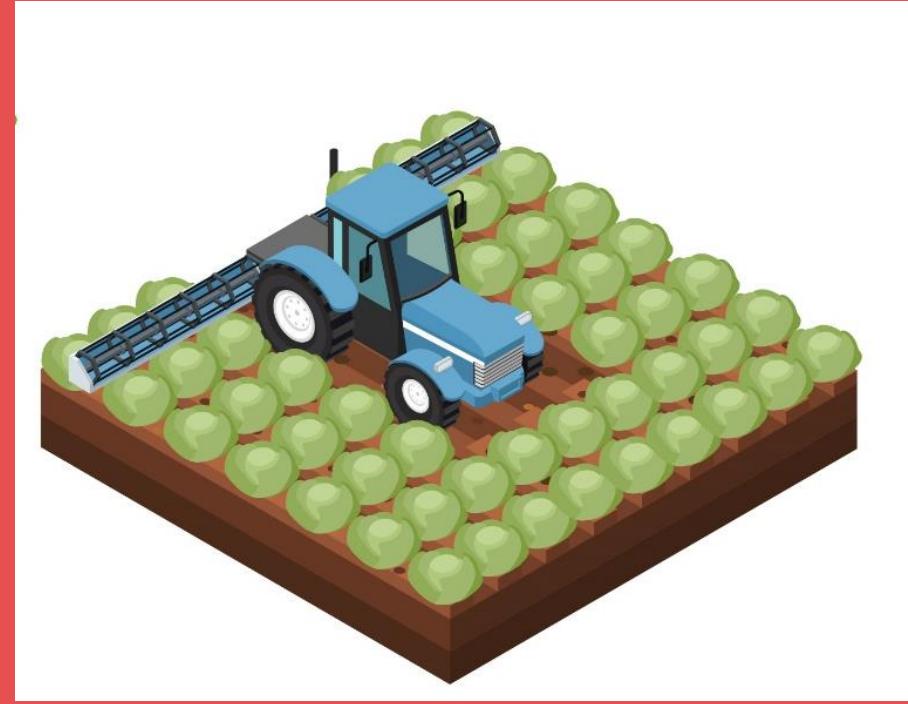
For different crop, the distance between the seeds change but due to intense fire-fighting poor farmers do not keep any standardization of distances

Current issues with seed sowing machine

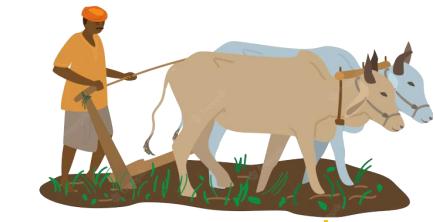


Future scope for KG Aggrotech

Crop maintenance



Key things for farm maintenance



Bull



Pesticides



Organic
Pesticides



Labourer



Fertilizer

