STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION - L4

BOTANY

PANKHURI MA'AM

ANTHE

AAKASH NATIONAL TALENT HUNT EXAM

Your Gateway To Success

For Class VII to XII

Current Students & Passouts

MISSION MBBS

MON - SAT
4PM - 8PM

DROPPERS BATCH

MON - FRI
2PM - 4PM

Aakash BYJU'S

NEET STUDENTS' SURVEY

LINK IN DESCRIPTION

https://t.me/neetaakashdigital

Recall! Neolithic Age

Transition from hunters to cultivators

- Early humans realised the need for plants as food and started cultivating them.

Traditional Farming

- **Wooden ploughs and ox** for ploughing

Traditional Farming

- **Human labourers** for sowing

Traditional Farming

- Earlier **cattle dung and natural manure** was used as **fertilisers** to enrich the soil with nutrients.

Traditional Farming

- **Cattle dung** and natural **manure** as fertilisers

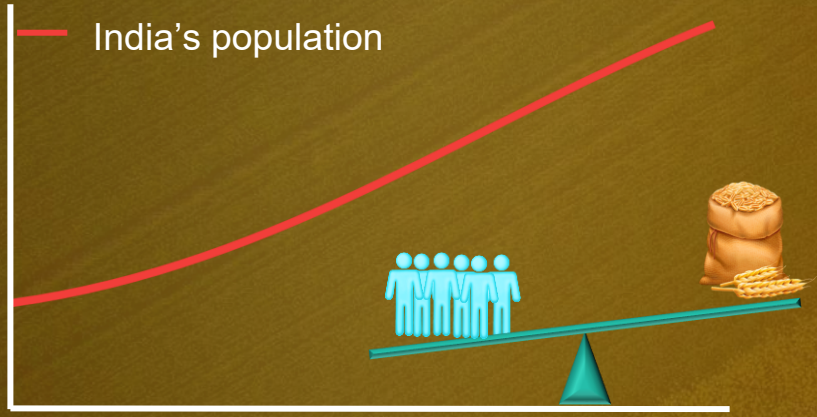
Traditional Farming

- Dependence on **monsoon rains** for water
- **Single crop per year**

Traditional Farming

- **Human labourers** for harvesting

Traditional Farming



- Traditional farming eventually could not cater to the needs of people because of exponentially growing population.

Green Revolution

Green Revolution

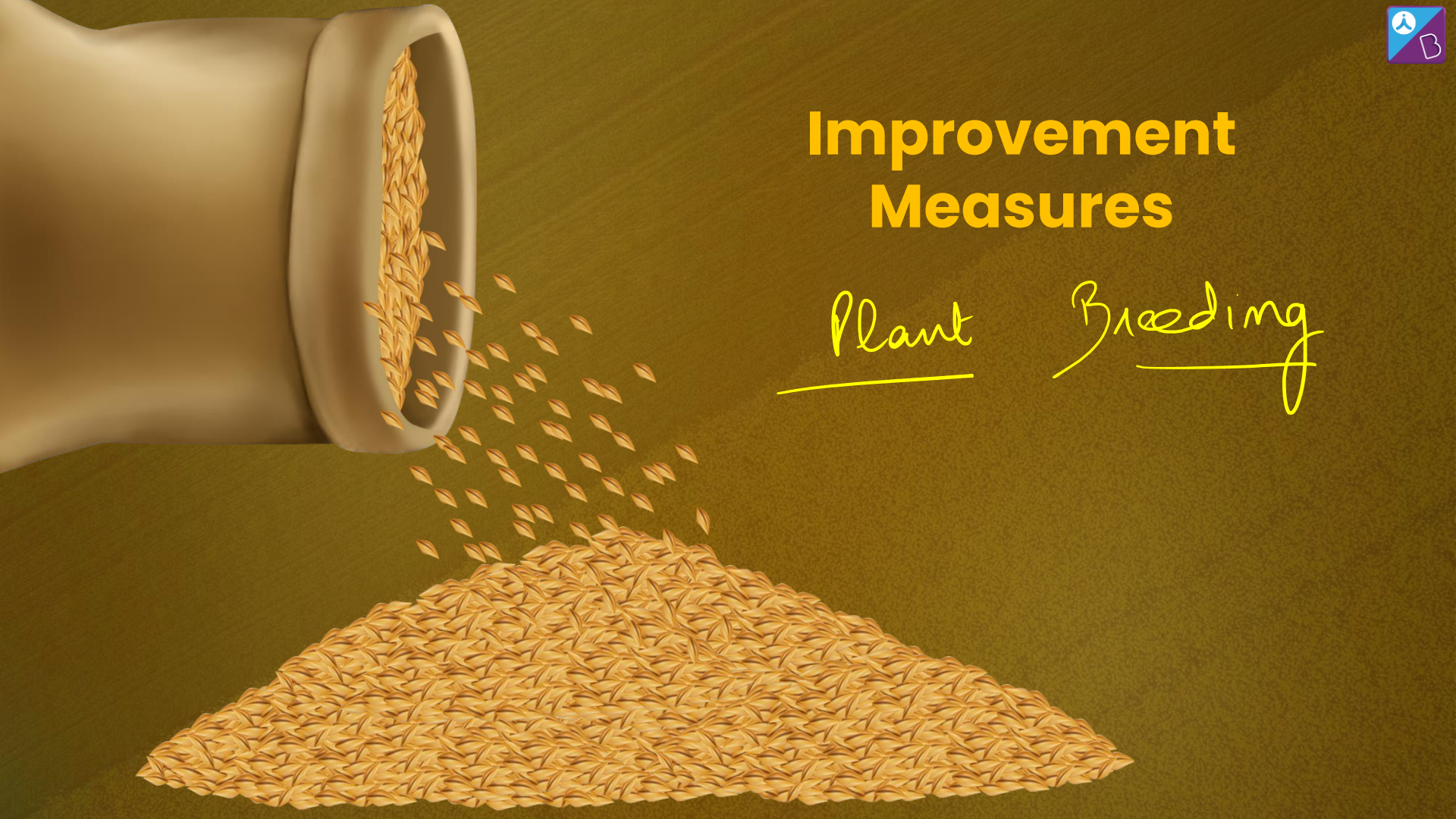
Set of initiatives that helped revolutionise agriculture and increase production of food crops

Green Revolution

- Initiated by **Dr. Norman E Borlaug** in Mexico

Green Revolution

- Launched in India by Ministry of Agriculture during mid 1960's


Improvement
Measures
Plant Breeding

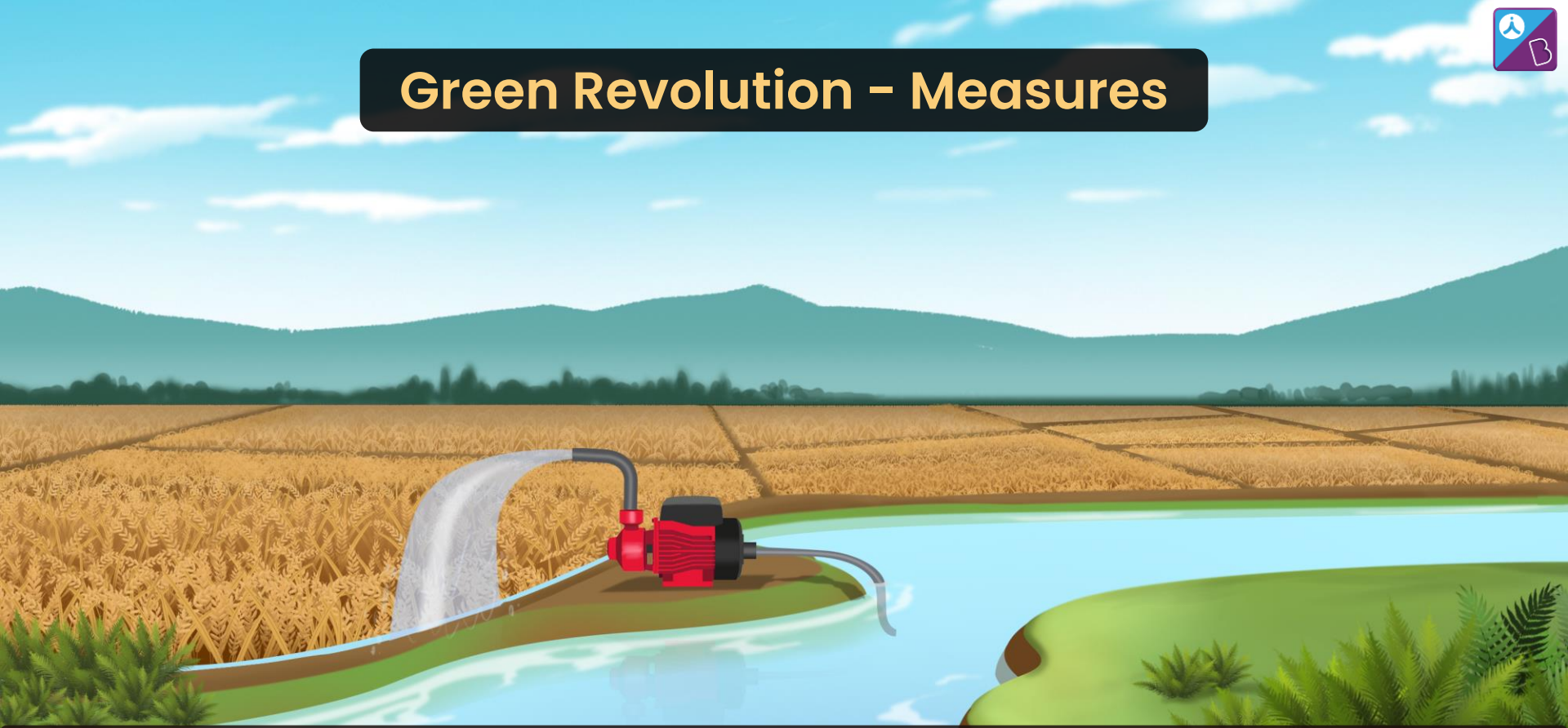
Green Revolution - Measures

- Use of **tractors for ploughing** field

Green Revolution - Measures

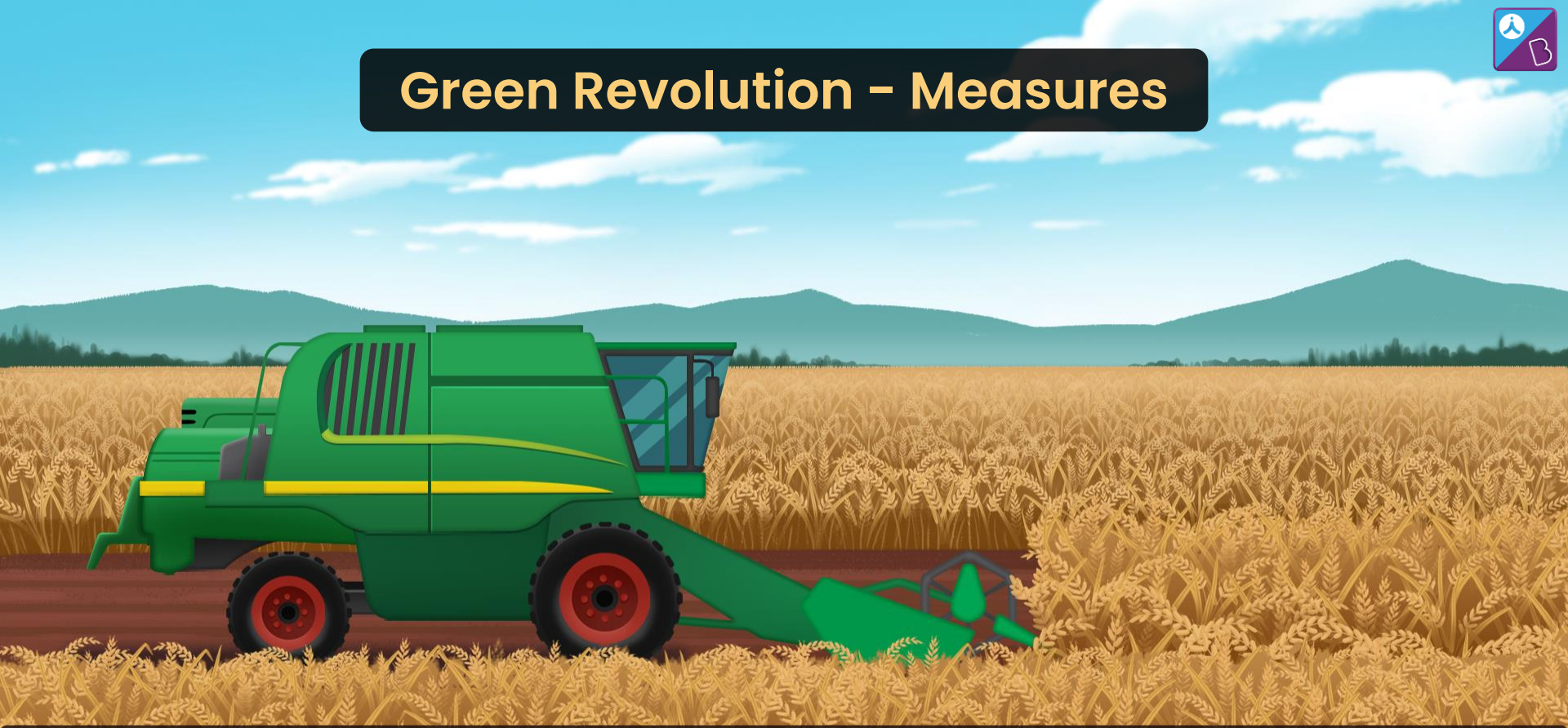
- Use of **pesticides and synthetic fertilisers**

Green Revolution - Measures



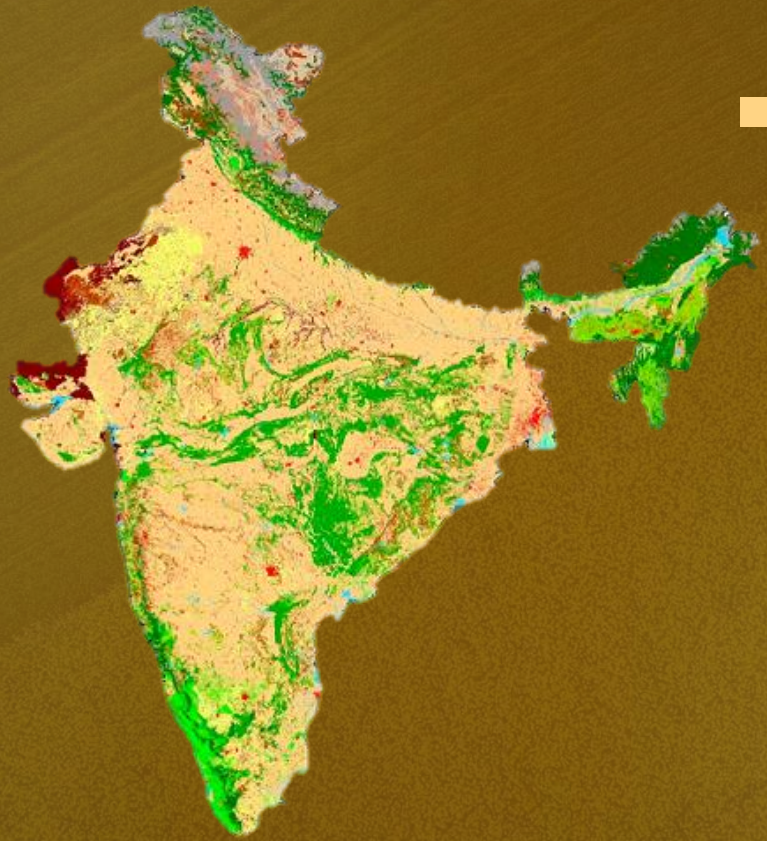
- Use of **pumps to drive water** from nearby water body
- **Reduced dependence on monsoon**

Green Revolution - Measures



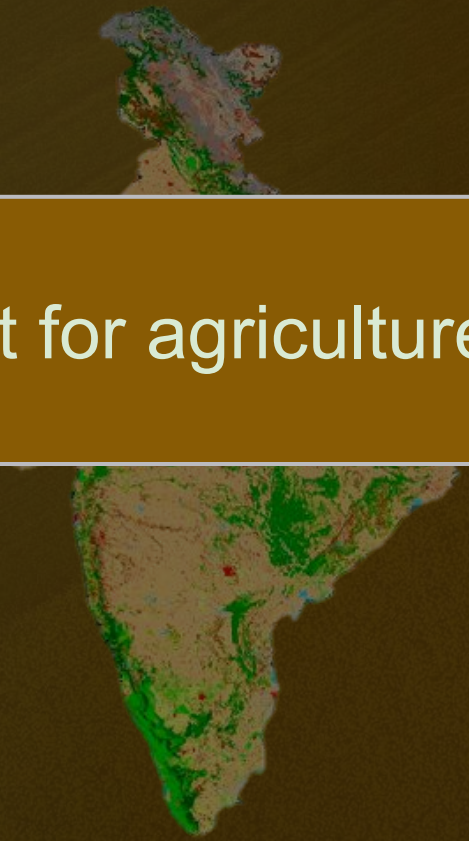
- Human labourers replaced by **modern machines**

Green Revolution - Measures



Land fit for agriculture

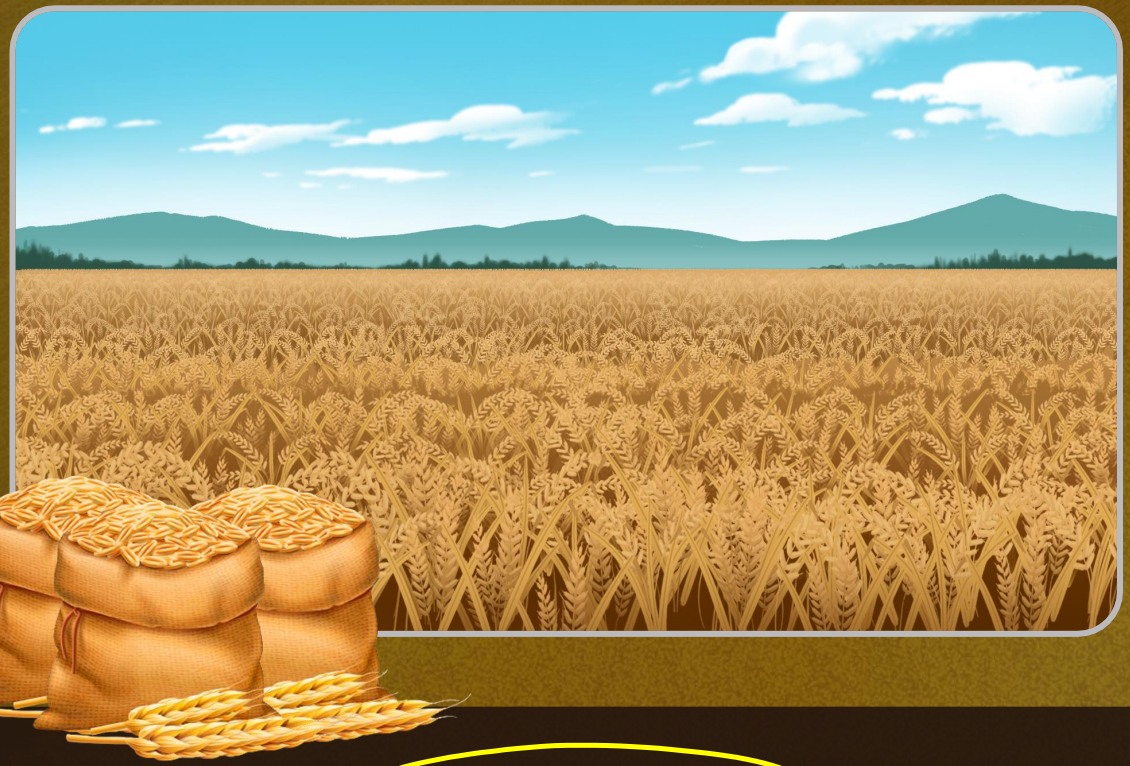
Green Revolution - Measures



Land fit for agriculture

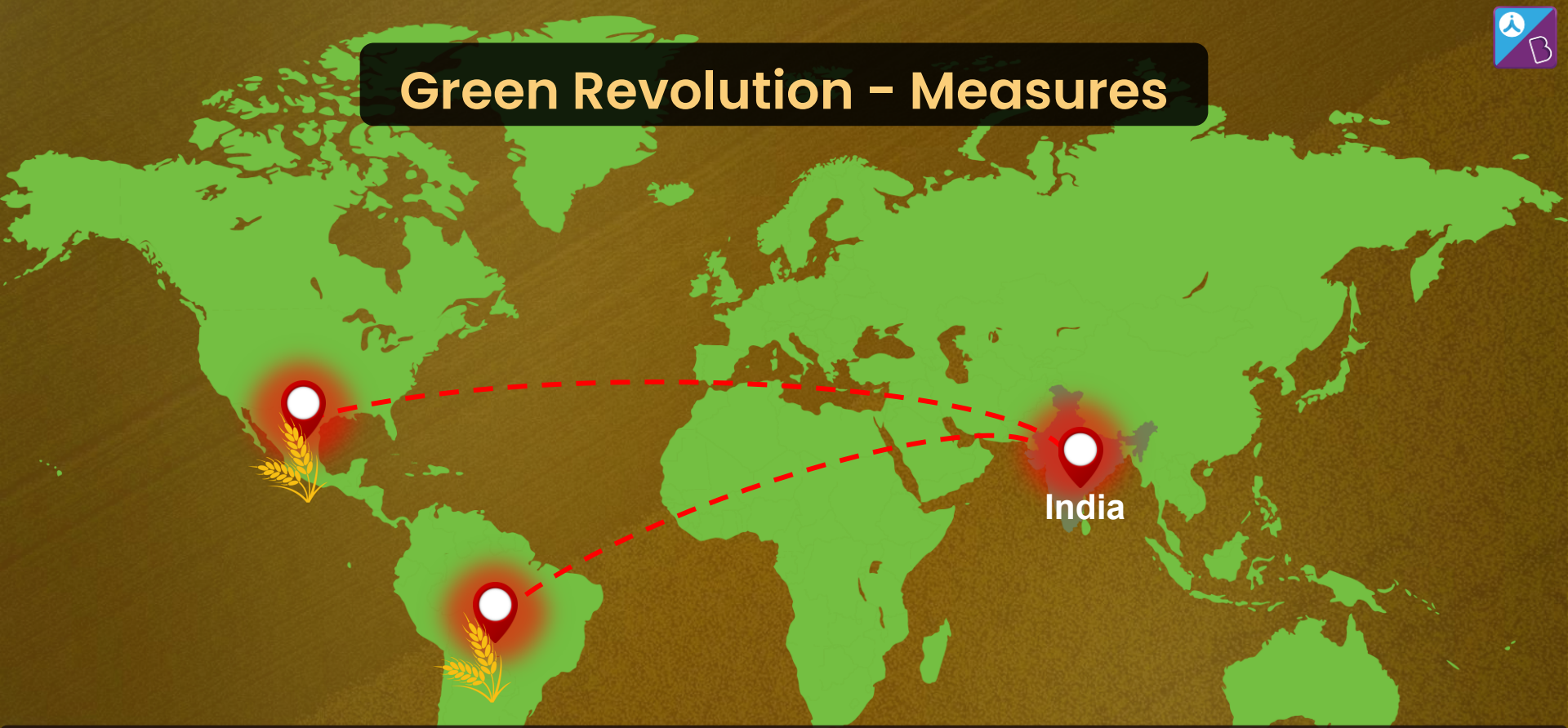
Land fit for agriculture is limited

Green Revolution - Measures



- Necessary to increase **yields per unit area**

Green Revolution - Measures



- Importing **high yielding varieties (HYVs)**

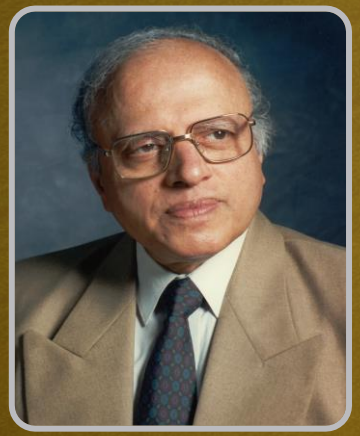
Green Revolution – HYVs

- HYVs were further modified to suit Indian climate by **Dr. M S Swaminathan**

Did You Know ?

Did You Know ?

Wheat, Rice, Maize, Bajra



Dr. M S Swaminathan

Dr. M S Swaminathan is honoured as
'Father of Green Revolution in India'


High Yielding
Varieties (HYVs)

Wheat and Rice

Green Revolution – HYVs

- Norman E. Borlaug developed **semi-dwarf wheat** at International Centre for Wheat and Maize Improvement, Mexico.

High Yielding Varieties (HYVs)

Indigenous wheat

Long stature

Consume more nutrients

Low yield

Semi-dwarf wheat

Short stature

Better resistance

High yield

High Yielding Varieties (HYVs)

Commercialised

Semi- dwarf wheat

Introduced all over the wheat-growing belt of India (1963)

Wheat

- Kalyan Sona and Sonalika

- ☑ Resistant to disease
- ☑ Semi-dwarf
- ☑ High yielding

High Yielding Varieties (HYVs)

- During the period 1960 to 2000, wheat production increased from 11 million tonnes to 75 million tonnes

High Yielding Varieties (HYVs)

Rice

- Semi-dwarf rice varieties were derived from
  - IR-8
    Developed at International Rice Research Institute (IRRI), Philippines
  - Taichung Native-1 (from Taiwan)

High Yielding Varieties (HYVs)

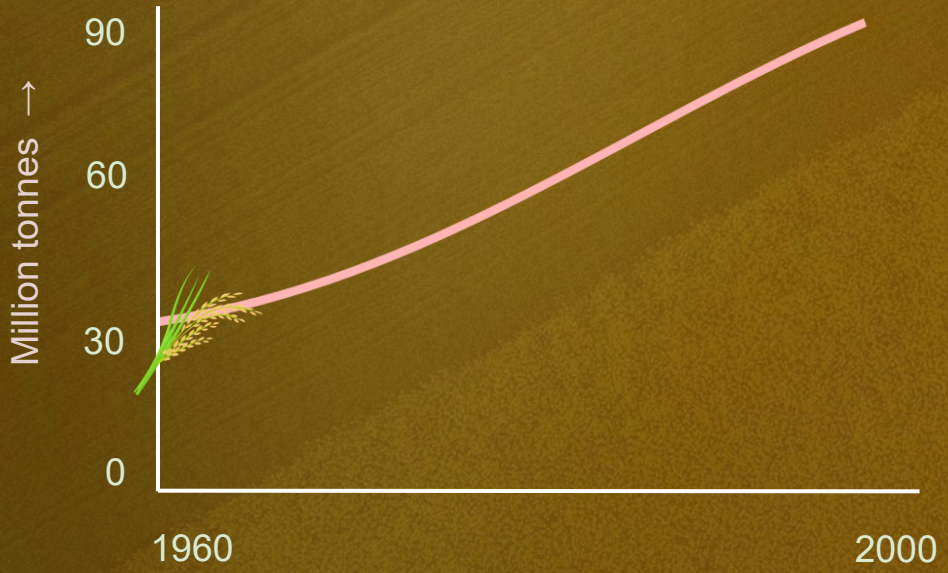
Better-yielding semi-dwarf varieties, Jaya and Ratna were developed in India.

Ratna

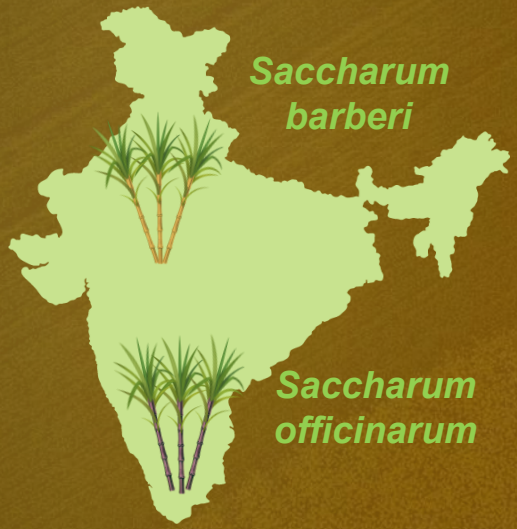
Jaya

High Yielding Varieties (HYVs)

During 1960 to 2000, rice production increased from 35 million tonnes to 89.5 million tonnes



High Yielding Varieties (HYVs)



Sugarcane

- India is one of the major countries that grows sugarcanes
  - *Saccharum barberi* was grown in north India
  - *Saccharum officinarum* was grown in south India

Green Revolution – HYVs

Taiwan

Taichung
Native -1

Philippines

IR 8

Green Revolution – HYVs

Rice

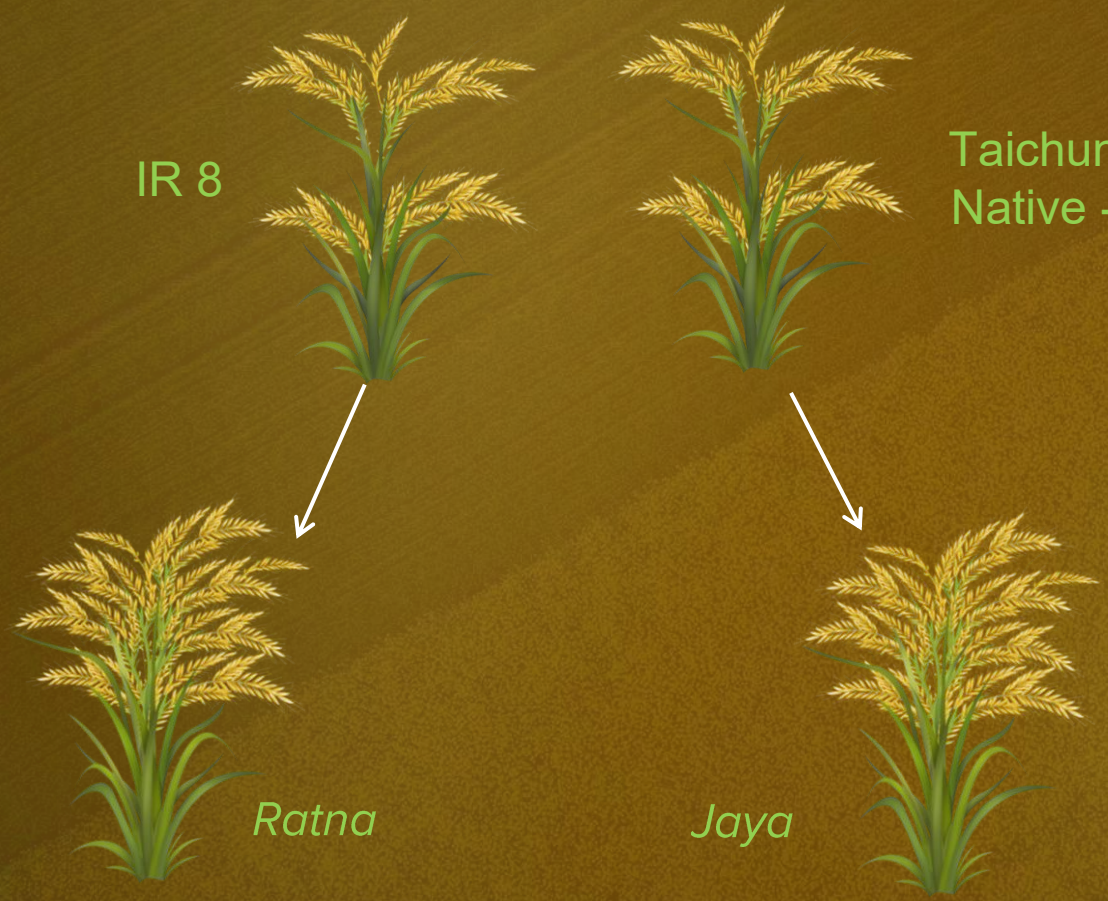
- IR 8, Phillipines – **dwarf and high yielding**

Green Revolution – HYVs

Rice

- Taichung Native-1, Taiwan – **dwarf, resistant to disease**

Green Revolution – HYVs

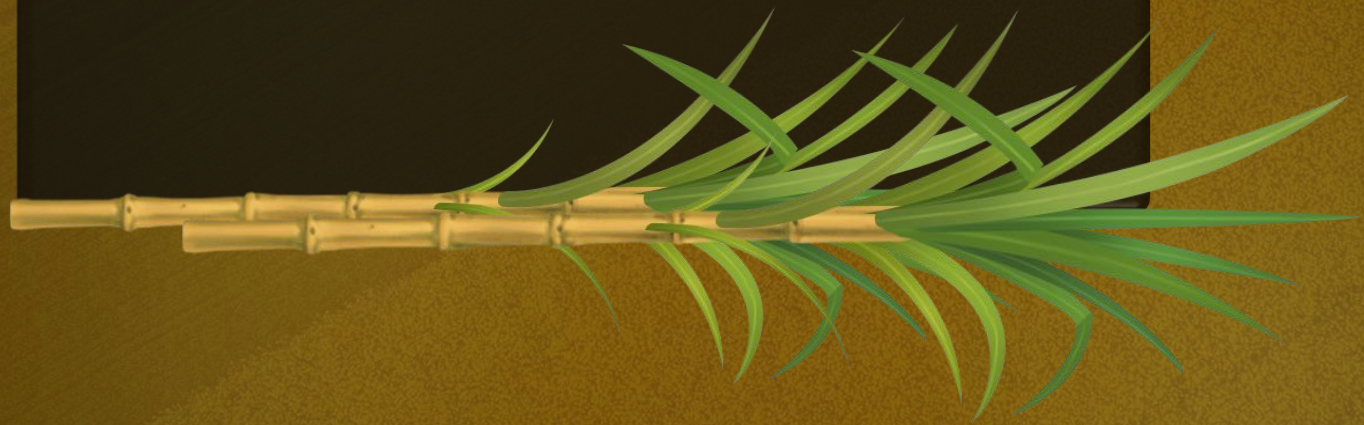


Green Revolution – HYVs

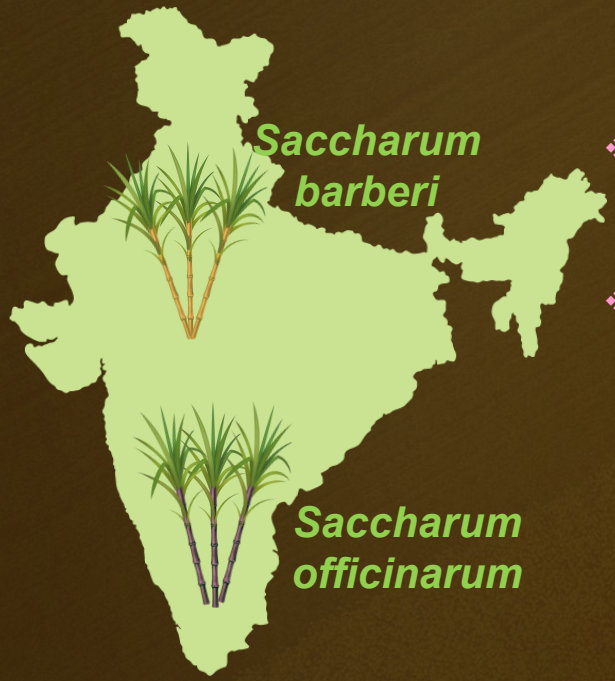
Rice

- Rice production **increased** from **35 million tonnes to 89.5 million tonnes**

Sugarcane



Green Revolution – HYVs



Sugarcane

- ***Saccharum barberi*** grow in north India
- ***Saccharum officinarum*** grow in south India

Green Revolution – HYVs

Saccharum barberi

Thin Stem → ← Thick Stem

Low sugar content

High sugar content

Low yield

High yield

Saccharum officinarum

Green Revolution – HYVs

Sugarcane

- ***Saccharum officinarum*** did not grow well in north India

Green Revolution – HYVs

Saccharum barberi x *Saccharum officinarum*

- [x] Thick Stem
- [x] High sugar content
- [x] High yield
- [x] Ability to grow in North India

Millets

Green Revolution – HYVs

Millets

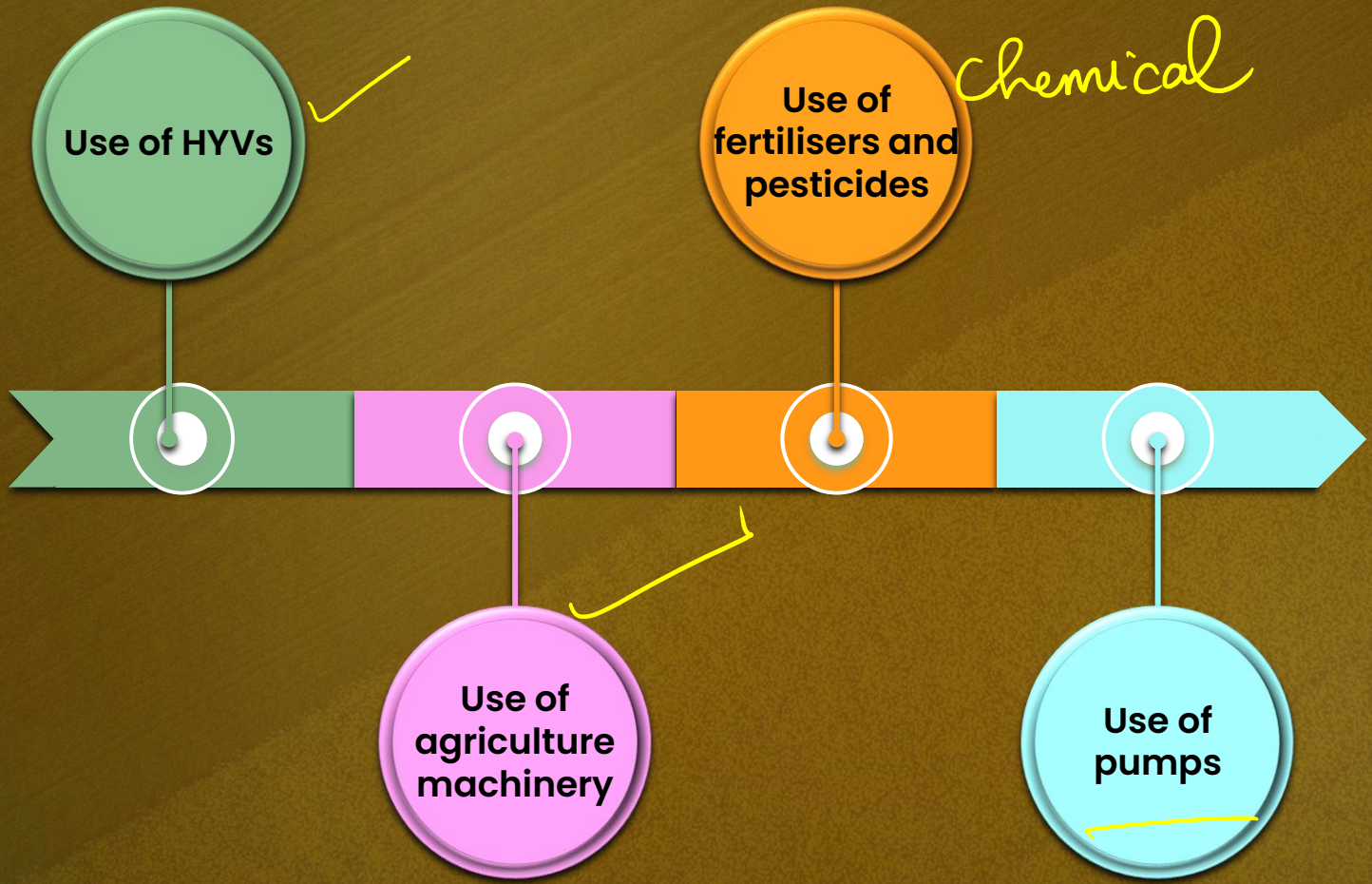
- Considered to be **'coarse grains'** – fed to animals
- Grown in **arid regions**
- Include **maize, jowar, bajra, finger millet, etc.**

Green Revolution – HYVs

- [x] High yield
- [x] Resistant to water stress

Hybrid maize, jowar and bajra

Green Revolution - Measures



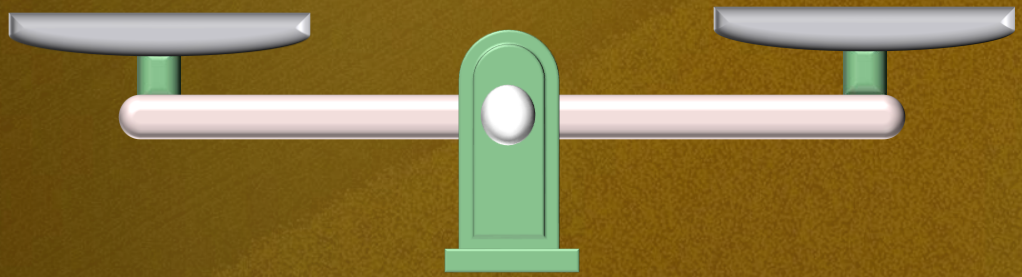
Aftermaths of Green Revolution

Pros

- Increased crop production
- Farmers were profited
- Reduced food price

Cons

- Extinction of indigenous varieties
- Lack of biodiversity in crops



Use of HYVs

Aftermaths of Green Revolution

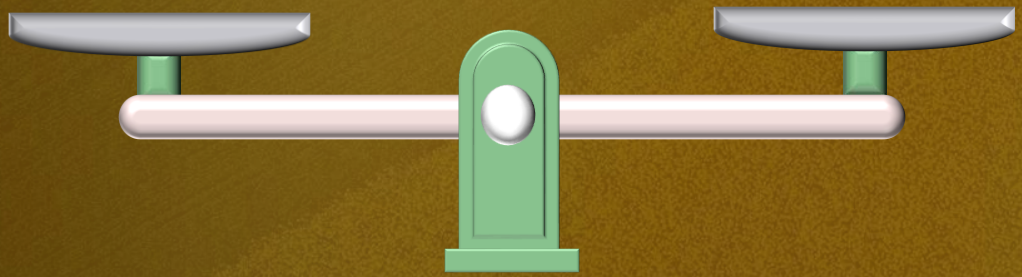
Pros

- High yield
- Reduced loss

Cons

- Water and soil pollution
- Harmful for humans if consumed

chemical fertilisers.



Use of fertilisers and pesticides

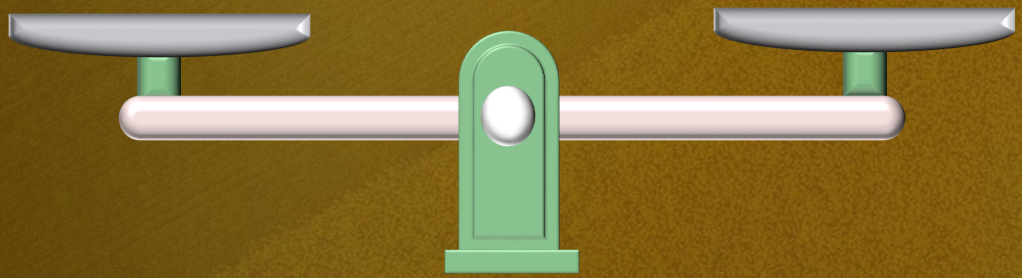
Aftermaths of Green Revolution

Pros

- Reduced labour cost

Cons

- Add up financial burden
- Labors lose job



Use of agriculture machinery

Keep Learning!