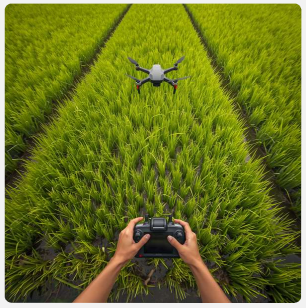
Philippines

Water-Smart. Sustainable.
Profitable.

Training on Rice Cultivation by AWD Method

Efficient, Climate-Smart Rice Production

2026



Presented by

Dr. A. K. Mohanty

www.krishibandhu.org

Importance of Rice in the Philippines

A Staple Crop Vital to Food Security

Rice is the cornerstone of Filipino agriculture and culture, feeding over 100 million people daily. As the primary source of calories for most Filipinos, rice cultivation supports millions of farming families and drives rural economies across the archipelago.

Food Security For Every Filipino Family.

CROPPING SEASONS

Main/Wet Season (WS) (*Tag-Ulan*)

- Planting: May - June
- Harvest: Sept - Oct

Secondary/Dry Season (DS) (*Tag-araw*)

- Planting: Nov - Dec
- Harvest: March - April

Third/Intermediate crop (*Palay-sawang*)

- Planting: Late March - April
- Harvest: July - August

Rice Varieties Prevailing in Capiz, Philippines

Main/Wet Season (WS) (*Tag-Ulan*) May - June planting

Common duration: 110-125 days

Common planting method: Transplanting

Commonly used varieties include:

- NSIC Rc222
- NSIC Rc216
- NSIC Rc160
- PSB Rc18
- Rc402 and Rc480

Hybrid varieties: Mestiso series in commercial farms

Flood-tolerant, disease-resistant, medium-duration varieties

Rice Varieties Prevailing in Capiz, Philippines

Secondary/Dry Season (DS) (*Tag-araw*) Nov - Dec planting

Common duration: 105–120 days

Common Planting methods: Transplanting/Wet DSR

Commonly used varieties include:

- NSIC Rc222
- Rc160
- Rc218
- Rc300 series
- Mestiso hybrids
- SL series hybrids in some municipalities

Dry season generally gives better yield and milling recovery.

High-yielding, fertilizer-responsive, good grain quality varieties

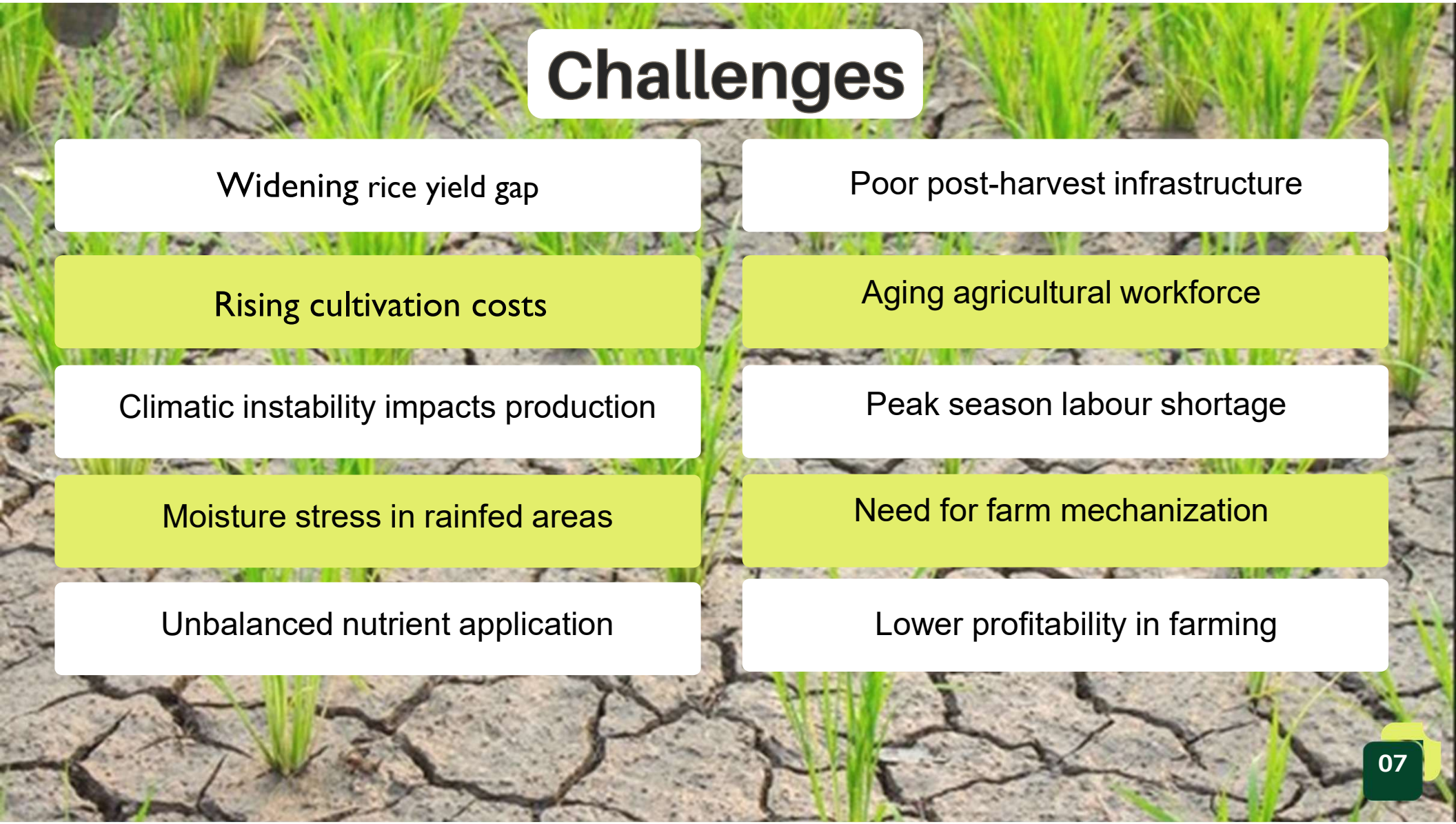
Rice Varieties Prevailing in Capiz, Philippines

Third/Intermediate crop (*Palay-sawang*) Late March – April planting

Common duration: 90–105 days
Common Planting methods: Mostly Wet DSR
Commonly used varieties include:

- Rc152
- Rc122
- some hybrid short-duration lines

These varieties help avoid overlap with typhoon onset as it is harvested in July – Early August.



Challenges

- Widening rice yield gap
- Rising cultivation costs
- Climatic instability impacts production
- Moisture stress in rainfed areas
- Unbalanced nutrient application
- Poor post-harvest infrastructure
- Aging agricultural workforce
- Peak season labour shortage
- Need for farm mechanization
- Lower profitability in farming

Principles of Scientific Rice Cultivation

Climate-Smart Rice Production

Scientific rice cultivation combines proven agricultural techniques with modern water management. These four key principles form the foundation of sustainable, high-yield rice farming that benefits both farmers and the environment.

- **Efficient water use through AWD method**
- **Balanced nutrient application timing**
- **Scientific pest and weed management**
- **Climate resilience and profitability**

What is AWD?

Alternate Wetting and Drying Technique

AWD is a water-saving irrigation technique where rice fields are allowed to dry intermittently instead of continuous flooding. The cycle involves irrigating the field, allowing the water to naturally recede, then irrigating again when the water level drops below a set threshold (typically 15cm below soil surface) in AWD pipe.

AWD Principle:

How It Works

Rice plants do not require continuous standing water throughout the crop growth period. Properly managed wetting and drying cycles can:

- Save irrigation water
- Improve root growth
- Reduce methane emissions
- Maintain or increase yield

Benefits of AWD in Rice Cultivation

Alternate Wetting and Drying (AWD) delivers multiple benefits for rice farmers. It significantly reduces water consumption by 15-30%, cutting irrigation costs. The technique promotes stronger plants with deeper root systems and healthier soil through improved aeration, reducing lodging risk.

- **Saves 15-30% irrigation water**
- **Promotes deeper root growth**
- **Reduces methane emissions significantly**
- **Improves soil aeration**

Critical Scientific Intervention in Rice cultivation:

Land Preparation

Plough the land 2-3 times by power tiller/tractor/buffalo driven plough and level the field for uniform distribution of water.

Seed Treatment

Use 20 kg of hybrid rice seed per hectare. Hybrid rice seeds supplied by the Government of the Philippines are generally pre-treated. However, to separate chaffy and unfilled grains from the seed lot, prepare a salt solution by dissolving 1 kg of salt in 10 litres of water. Place the seeds in the solution and discard the seeds that float, as they are usually unfilled or of poor quality.

Seed Treatment

If the seeds are untreated, they should be treated to protect against fungal diseases such as blast and sheath rot. Mix 2 g of Carbendazim or Thiram in 1 litre of water and treat 1 kg of seed by soaking for 10 hours. After fungicide treatment, drain the seeds and keep them in moist gunny bags in a dark room for 24 - 48 hours to allow sprouting before sowing in the nursery or for use in wet DSR sowing.

- Use 20 Kg hybrid seeds per hectare
- Discard floating seeds in salt solution test
- Apply fungicide treatment Carbendazim or Thiram
- Dry seeds and prepare for sowing or nursery

Nursery Management, Transplanting & Wet DSR Sowing

- Transplant healthy seedlings aged 18–20 days at a spacing of 20 × 20 cm to promote proper growth and tillering. Seedlings should have 3–4 leaves at the time of transplanting. Handle the seedlings carefully to avoid root damage and reduce transplanting shock. Maintain a shallow water level of 2–3 cm immediately after transplanting to support proper establishment.

- For Wet DSR sowing, broadcast germinated seeds on puddled soil.

Healthy Seedlings for Better Yields.

Nutrient Management

Proper fertilizer application is critical for maximizing rice yields while maintaining soil health. The recommended NPK rates depend on soil fertility: 100-30-30 NPK kg/ha for fertile soils or 140-60-60 NPK kg/ha for less fertile conditions. Strategic timing of nutrient application ensures optimal plant uptake and reduces waste.

Nitrogen: 50% basal, 25% tillering, 25% Panicle Initiation

Phosphorus: 100% basal application

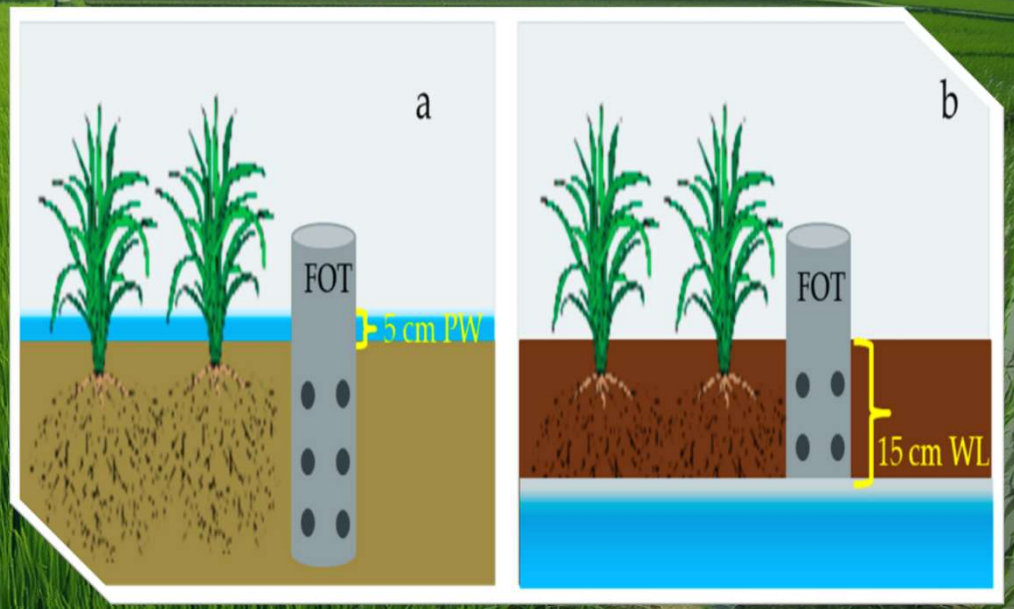
Potassium: 50% basal & 50% panicle stage

NPK: 100-30-30 or 140-60-60 kg/ha

Apply based on soil test results

Water Management
in AWD Method

Proper water management is critical for AWD success. During the establishment phase (first 15-21 days), maintain 3-5 cm water depth to suppress weeds and support seedling growth. This shallow flooding creates optimal conditions for young plants to establish strong root systems.

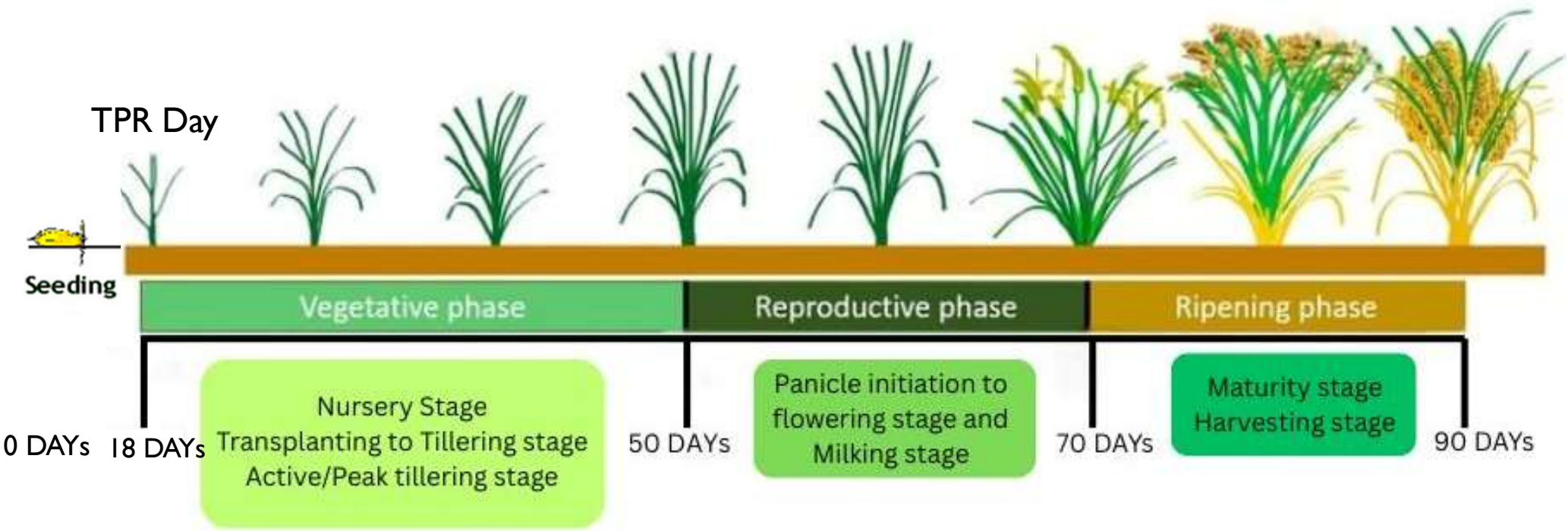


AWD Adoption Calendar for 90/120 Days Transplanted Rice varieties Under Irrigated Conditions

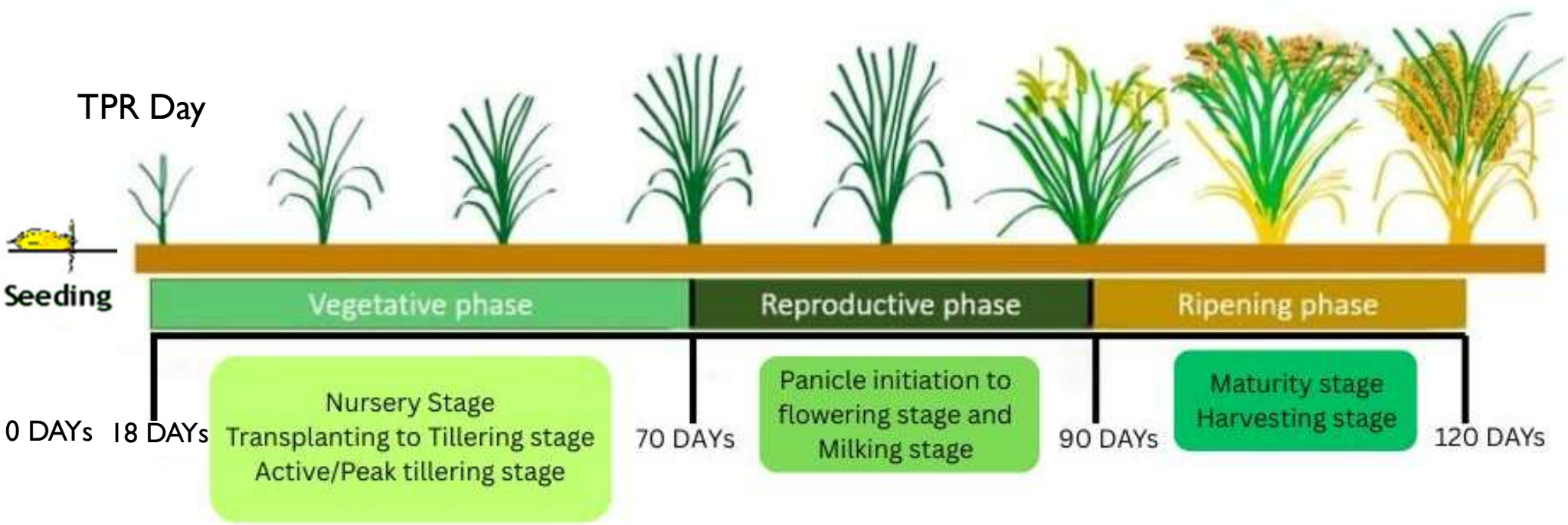
Crop Growth Phase	Crop Duration (120 Days)	Crop Duration (90 Days)	AWD Adoption
Nursery Stage	0 - 18 DAS	0 - 18 DAS	Flooding
Transplanting to Tillering stage	0 - 21 DAT	0 - 15 DAT	Flooding
Active/Peak tillering stage	22 - 49 DAT	16 - 30 DAT	AWD
Panicle initiation to flowering stage and Milking stage	50 - 70 DAT	31 - 50 DAT	Flooding
Maturity Stage	71 - 90 DAT	51 - 64 DAT	AWD
Harvesting stage	91 - 102 DAT	65 - 75 DAT	Water drainage from field
Irrigation Cycles in AWD to catch @ 5 to 6 days cycle per irrigation	7 – 9	4 – 5	-

DAS- Date After Sowing
DAT- Date After Transplanting

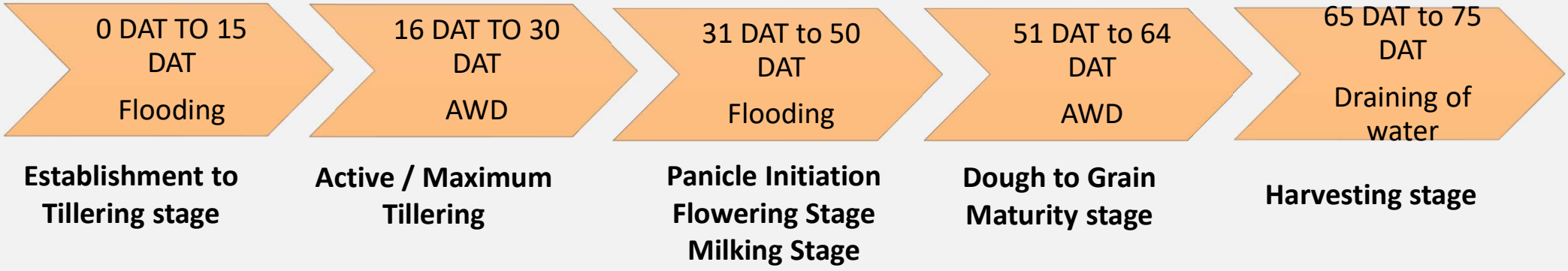
Crop cycle for 90 Days Transplanted Rice varieties Under Irrigated Conditions



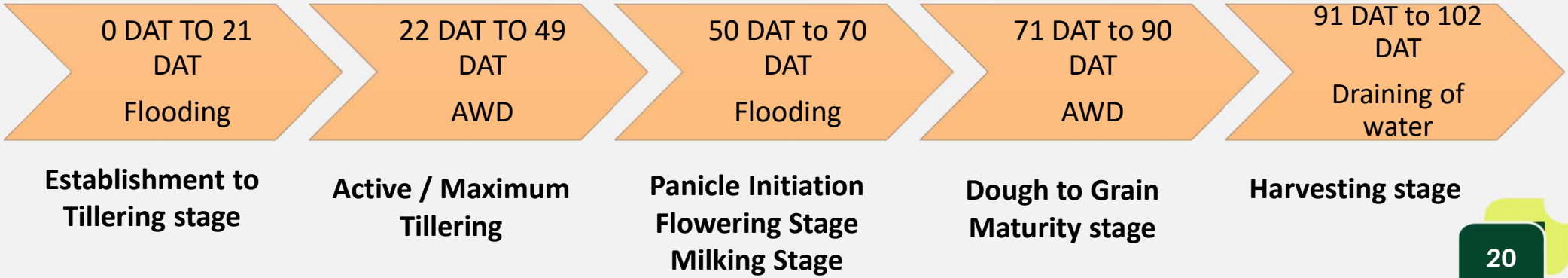
Crop cycle for 120 Days Transplanted Rice varieties Under Irrigated Conditions



AWD Adoption Calendar for 90 Days Transplanted Rice varieties



AWD Adoption Calendar for 120 Days Transplanted Rice varieties

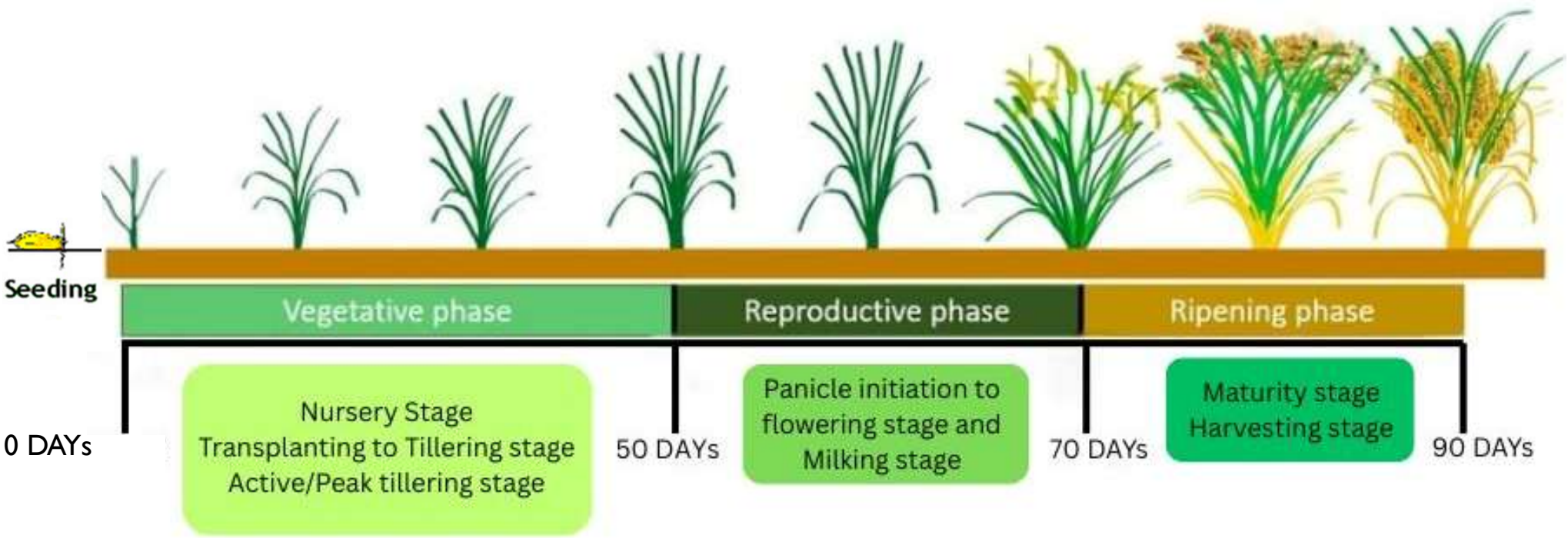


AWD Adoption Calendar for 90/120 Days Crop Varieties Under Wet DSR In Irrigated Conditions

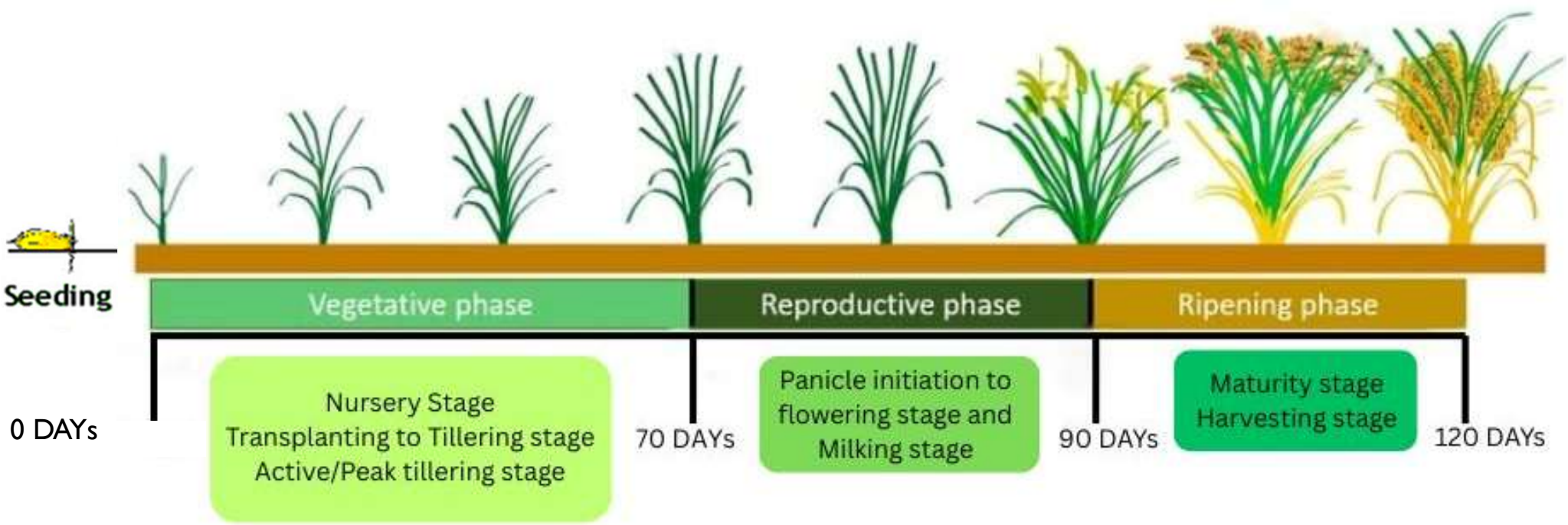
Crop Growth Phase	Crop Duration (120 Days)	Crop Duration (90 Days)	AWD Adoption
Sowing and Establishment	0 - 7 DAS	0 - 7 DAS	Moist/Flood conditions
Tillering stage	8 - 30 DAS	8 - 25 DAS	Flooding
Active/Peak tillering stage	31 - 60 DAS	26 - 45 DAS	AWD
Panicle initiation to flowering stage and Milking stage	61 - 80 DAS	46 - 66 DAS	Flooding
Maturity Stage	81 - 105 DAS	67 - 79 DAS	AWD
Harvesting stage	106 - 120 DAS	80 - 90 DAS	Water drainage from field
Irrigation Cycles in AWD to catch@ 5 to 6 days cycle per irrigation	9 – 11	5 – 6	-

DAS- Date After Sowing

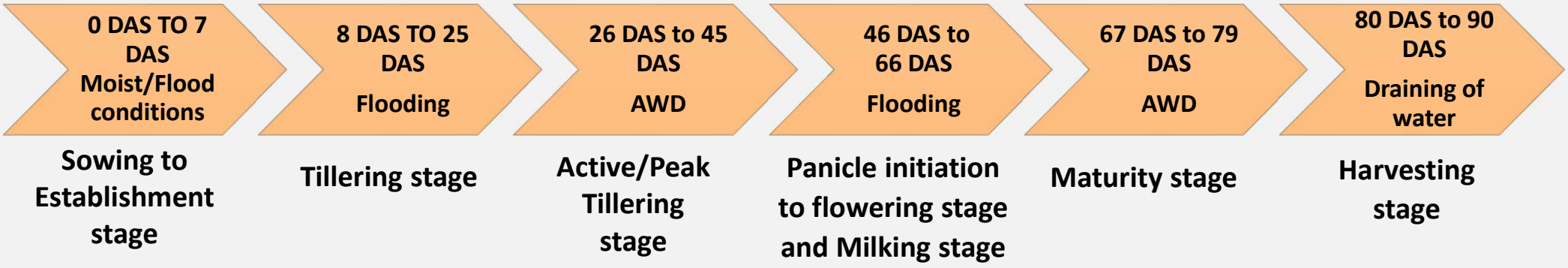
Crop cycle for 90 Days Wet DSR Rice varieties Under Irrigated Conditions



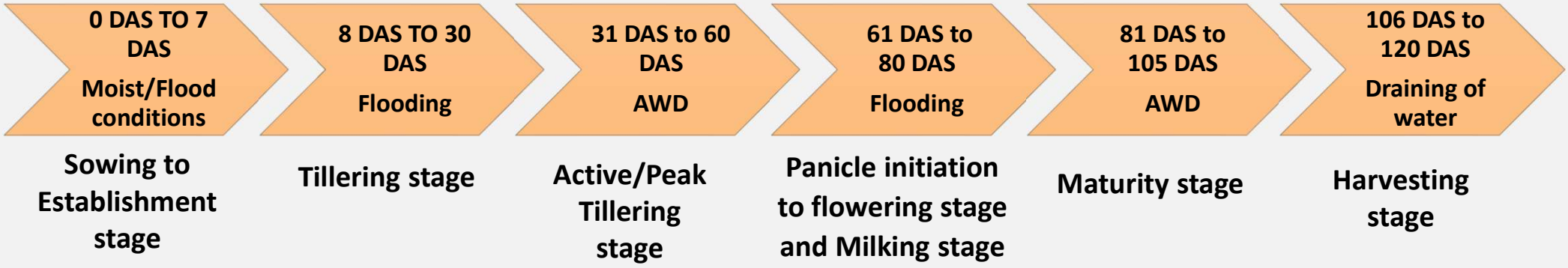
Crop cycle for 120 Days Wet DSR Rice varieties Under Irrigated Conditions



AWD Adoption Calendar for 90 Days Wet DSR Rice varieties



AWD Adoption Calendar for 120 Days Wet DSR Rice varieties



Weed Management

Dicots

Sedges

Monocots

- Maintain 3–5 cm standing water for the first 3 weeks after transplanting to suppress weed germination and ensure proper crop establishment.
- Apply pre-emergence herbicides such as Pretilachlor 50% EC @ 500–620 ml/hectare, Butachlor 50 EC 1.24 kg/hectare or 2.47 litres/hectare, Pendimethalin @ 1.2–1.5 litres/hectare., or Pyrazosulfuron-ethyl @ 150–200 g/hectare within 0–5 days after transplanting.
- Apply post-emergence herbicides such as Almix (Metsulfuron-methyl 10% + Chlorimuron-ethyl 10% WP) @ 20–25 g/hectare, Bispyribac Sodium 10% SC @ 500 ml/hectare, or 2,4-D @ 200–370 kg a.i./hectare at 20–25 days after transplanting.
- Hand Weeding at 45-50 DAT, if required

Insect and Disease Management

Avoid excess nitrogen fertilizer application as it promotes succulent growth that attracts pests and increases disease susceptibility. Balanced fertilization is key to pest prevention.

Common Insect pests in Philippine rice fields include stem borers, leaf folder, gall midge and Brown Plant Hopper (BPH). The common diseases seen are Blast, Sheath blight, Bacterial leaf blight and Damping-off diseases.
Regular field monitoring is essential for early detection and management.

Insect Management

Sl.No.	Insects	Typical Symptoms	Recommended Control Measures
1	Stem borer		Use pheromone traps, avoid excess nitrogen, apply Profenophos @ 2ml/L of water or Cartap hydrochloride 4G @ 12 Kg/hectare as recommended
2	Leaf folder		Use Chloropyriphos 18.5 SC @ 0.3 ml/L water or Cartap Hydrochloride 50 WP @ 1.5 g/L water or Profenofos 50 EC @ 2 ml/L water
3	Gall midge		Use resistant varieties, avoid delayed planting, spray Monocrotophos or Phosalone or Endosulfan@ 2ml/L of water or Carbofuran or Phorate @ 12 Kg/hectare during transplanting
4	Brown plant hopper		Avoid excess nitrogen and standing water, maintain field sanitation, spray Acephate 75 SP @ 1–1.5 g/L water, Imidacloprid 17.8 SL @ 1 ml/L water or Fipronil 5 SC @ 2 ml/L water

Disease Management

Sl.No.	Disease	Typical Symptoms	Recommended Control Measures
1	Blast disease		Use resistant varieties, balanced fertilizer application, spray Tricyclazole 75 WP @ 0.6 g/L water or Isoprothiolane 40 EC @ 1.5 ml/L water.
2	Sheath Blight		Maintain proper plant spacing, reduce excess nitrogen and spray Validamycin 3L @ 2 ml/L water or Hexaconazole 5 EC @ 1 ml/L water.
3	Bacterial Leaf Blight		Use disease-free seeds, balanced fertilization, avoid excess water stagnation and spray Copper Oxychloride @ 1.5g/L water along with Streptocycline @ 0.1 g/L water.
4	Damping-off disease		Ensure proper drainage, avoid dense sowing, treat seeds with Carbendazim @ 2 g/kg seed and drench nursery beds with Mancozeb @ 2.5 g/L water.

Harvesting

Rice

Harvest when 80-85% of grains are mature and golden yellow in color. At this stage, grains have reached optimal moisture content (20-25%) for threshing. Harvesting too early results in immature grains with lower milling recovery, while delayed harvest leads to shattering losses and reduced grain quality.

Combine Harvester

Manual harvesting by Sickle

MRV (Monitoring, Reporting and Verification) required to be recorded by Field officer

1. FARM REGISTRATION FORM (Baseline – One-time)

A. Farmer & Plot Details

- Farmer ID
- Farmer Name
- Contact Number
- Municipality / Barangay
- GPS Coordinates (Lat, Long)
- Plot ID (unique code)
- Plot Area (ha)
- Land Type (Irrigated / Rainfed / Pump)
- Irrigation Type:
  - Canal (NIA)
  - Communal
  - Pump
  - Mixed

B. Irrigation Governance

- Irrigators Association (IA) Name
- IA Contact Person
- Canal Name / Pump Source
- Rotation Schedule (days/week)

C. Crop Details

- Season: Wet / Dry
- Variety
- Planting Method (Transplant / Direct seeded)
- Date of Sowing / Transplanting

2. FIELD WATER MANAGEMENT LOG (CORE MRV SHEET)

This is the most important AWD MRV document

Daily / Visit-based Record

Date	Plot ID	Crop Stage	Water Level (cm)	AWD Threshold Reached? (Y/N)	Irrigation Done? (Y/N)	Source (Canal/Pump/Rain)	Remarks

Measurement rules:

- Water level measured using AWD pipe
- Record:
  - +ve = standing water
  - 0 = soil surface
  - –ve = below ground

MRV compliance checkpoints:

- AWD drying reached –15 cm (or approved threshold)
- Irrigation triggered after threshold
- No continuous flooding except critical stage

3. FIELD WATER MANAGEMENT LOG (CORE MRV SHEET)

Cross-checks farmer claim vs actual irrigation

Date	Plot ID	Irrigation Start Time	Duration (hrs)	Water Depth Applied (cm)	Source	Controlled by (IA/Farmer)

Why this is important:

- Verifies intermittent irrigation
- Detects over-irrigation (common in pump areas)

4. CROP STAGE TRACKING (MANDATORY for MRV)

Plot ID	Stage	Start Date	End Date
	Nursery		
	Tranplanting & Establishment		
	Tillering		
	Panicle Initiation		
	Flowering		
	Milking		
	Maturity		
	Harvesting		

Critical MRV rule: AWD **must NOT be applied upto 21 days after transplanting and during flowering stage**

5. PHOTO & GEO-TAG EVIDENCE (STRONGLY RECOMMENDED)

For each plot:

- AWD pipe installation photo
- Water level photo (At flooding, moist condition and 2 times at -15 cm water level)
- Irrigation event photo

Record format:

Date	Plot ID	Photo Type	GPS Tagged (Y/N)	Verified by

6. FIELD OFFICER VISIT LOG

Date	Officer Name	Plots Covered	Observations	Farmer Compliance (Good/Moderate/ Poor)	Action Taken

Common Mistakes to be Avoided in AWD Practice

- Over-irrigation during AWD cycles
- Poor field leveling causing uneven drying patterns
- Delayed pest or weed control measures
- Not maintaining records for carbon projects

Summary
and Conclusion

The Alternate Wetting and Drying (AWD) method represents a significant advancement in rice cultivation. This climate-smart irrigation technique saves 15-30% water while reducing production costs. Combined with proper scientific practices, AWD delivers stronger plants, better yields, and increased profitability for Filipino rice farmers.

- Climate-smart water management
- Reduces production costs
- Improves yield and profit
- Maximizes carbon revenue
- Supports food security

Summary and Conclusion

Under irrigated rice conditions in Capiz Province, clay loam soils generally reach −15 cm AWD threshold within about 3–5 days, while clay soils may require about 5–7 days, depending on percolation, evapotranspiration, soil cracking, and field conditions. AWD irrigation should therefore be guided primarily by field water tube observations rather than fixed irrigation intervals.

Climate-Smart Rice Production

AWD Training

Thank You & Questions?

2026

Apply AWD in Your Fields and Share Your Success Stories

Presented by

Dr. A. K. Mohanty

Senior Consultant RRGI, Philippines and KBC, India

+91 94371 06404

drakmohanty1962@gmail.com

Paradise Street Poblacion Proper, Mambusao, Capiz, Region VI
(Western Visayas), 5807.

www.krishibandhu.org