



Japan International Cooperation Agency



Agriculture and Food Authority
Horticultural Crops Directorate



Ministry of Agriculture, Livestock and Fisheries
State Department for Crop Development & Agricultural Research

Smallholder Horticulture Empowerment & Promotion Project for Local and Up-Scaling (SHEP PLUS)

“Changing Farmers’ Mindset from “Grow and Sell” to ”Grow to Sell””

GENERAL HORTICULTURAL CROP PRODUCTION & POST-HARVEST HANDLING TECHNIQUES (GHCP&PHHT) 20

Presented to the County & AFA (HCD) Staff in charge of the
SHEP PLUS Model Farmer Groups during the FT-FaDDE

Prepared by SHEP PLUS

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1. Introduction: Background

General Horticultural Crop Production & Post-Harvest Handling Techniques (GHCP&PHHT) 20

(PART 1: Background Information)

Country: _____ Sub-County: _____ District (DC/UD/CC): _____

Group Name: _____ Tel No.: _____

Name of Farmer: _____ Male ☐ Female ☐ Farmer Code: _____

(PART 2: Horticultural Crop Production Techniques) Please tick appropriate box "YES" or "NO"

Pro to Post Collection - Region	Techniques and Technologies Adopted for Adoption	Yes	No
1. The Collection Procedures	1. Do you maintain a market survey to determine the crop(s) to collect?		
	2. Do you prepare and set up a display cabinet/stand to place produce for better marketing?		
	3. Do you maintain a record of sales to track the crop(s) to collect?		
	4. Do you maintain a record of sales to track the crop(s) to collect?		
2. Post Collection Procedures	5. Do you maintain a record of sales to track the crop(s) to collect?		
	6. Do you maintain a record of sales to track the crop(s) to collect?		
	7. Do you maintain a record of sales to track the crop(s) to collect?		
	8. Do you maintain a record of sales to track the crop(s) to collect?		
3. Crop Production	9. Do you use any of the following techniques to produce crops?		
	10. Do you use any of the following techniques to produce crops?		
	11. Do you use any of the following techniques to produce crops?		
	12. Do you use any of the following techniques to produce crops?		
4. Crop Management	13. Do you use any of the following techniques to produce crops?		
	14. Do you use any of the following techniques to produce crops?		
	15. Do you use any of the following techniques to produce crops?		
	16. Do you use any of the following techniques to produce crops?		
5. Harvest	17. Do you use any of the following techniques to produce crops?		
	18. Do you use any of the following techniques to produce crops?		
	19. Do you use any of the following techniques to produce crops?		
	20. Do you use any of the following techniques to produce crops?		
6. Post Harvest Handling	21. Do you use any of the following techniques to produce crops?		
	22. Do you use any of the following techniques to produce crops?		
	23. Do you use any of the following techniques to produce crops?		
	24. Do you use any of the following techniques to produce crops?		
7. Post Harvest Handling	25. Do you use any of the following techniques to produce crops?		
	26. Do you use any of the following techniques to produce crops?		
	27. Do you use any of the following techniques to produce crops?		
	28. Do you use any of the following techniques to produce crops?		

Refer to the Handout: 1-2 given during "1. Objective"

Fig.1: A check list of the GHCP&PHHT 20

1. Introduction: Background Cont'

- **General Horticultural Crop Production & Post-harvest Handling Techniques (GHCP&PHHT) 20** applies to the fundamental practices essential for horticultural crop production.
- The fundamental practices are categorized into **7 broad topics** and **20 sub-topics (refer to the Handout 1-2)** based on the Smallholder Horticulture Empowerment Project (SHEP), SHEP UP and SHEP PLUS experiences in mitigating production and marketing challenges facing smallholder horticultural farmers.

1. Introduction: Background Cont'

- The **7 broad topics** (Cultivation stages) are:
 1. Pre-Cultivation Preparation
 2. Land Preparation
 3. Crop Establishment (Planting/Transplanting)
 4. Crop Management
 5. Harvest
 6. Post-Harvest Handling
 7. Cost and Income Analysis

1. Introduction: Background Cont'

- The **20 sub-topics (Techniques)** under each broad topic are:

1. Pre-Cultivation Preparation:

- 1)Market Survey
- 2)Crop Planting Calendar(s)
- 3)Soil Testing (Sampling & Analysis)
- 4)Manure/ Composting
- 5)Quality Planting Material(s)

2. Land Preparation:

- 6)Land Preparation Practices
- 7)Incorporation of Crop Residues
- 8)Basal Application

1. Introduction: Background Cont'

3. Crop Establishment:

- 9) Raising Seedlings
- 10) Planting/transplanting spacing
- 11) Fertilizer Application

4. Crop Management

- 12) Supplement Water Application
[Requirement]
- 13) Timely weeding
- 14) Top-dressing
- 15) Pests & Diseases Management Practices
- 16) Safe & Effective Use of Pesticides

1. Introduction: Background Cont'

5. Harvest:

17)Harvesting Indices

6. Post-Harvest Handling:

18)Appropriate Containers

19)Value Addition Techniques

7. Cost and Income Analysis:

20)Farm records for cost and Income Analysis

- The issues outlined in the **20 sub-topics** might not necessarily be applicable in all the cases, such as fruit trees, flowers, mushrooms

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q1



Market survey in progress

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q1 Cont'

“Does the farmer undertake market survey to determine the crop(s) to cultivate?”

- **Market survey** is the first fundamental practice that smallholder farmers **must** undertake regularly in order to realize economic returns from farming
- It provides useful information in guiding farmers in producing what they can sell
- The results of the **market survey** determine what the farmer can sell in terms of **quality & quantity** and **the anticipated profit margins**

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q1 Cont'

- Farmers should obtain the following information on the crop(s) during the **market survey**:
 - **The peak demand** month(s) for crop produce
 - **The price of crop** during the **peak demand**
 - **The crop variety** that has the highest demand
 - Supply requirements (**quantities** and **frequency**)
 - **Quality of the market requirements**
 - **The source of current supply**
 - **Potential buyers, terms and modes of payment**
 - **Marketing challenges**
 - Dealer's **willingness** to purchase the crop etc.

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q2

CROP PLANTING CALENDER							
Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Land Preparation Seedbed of 1 m width & a convenient length Make drills on the seedbed at a spacing of 10 – 20 cm apart Thinly sow & cover lightly with soil Seed rate is 50g/acre	Takes 30 DAS before trans-Planting & 10 – 15 cm high Spacing of 30 cm between Row & 10 – 15 cm btw plants Direct field establishment tilth rows that are 30 – 40 cm apart Manure 8 t/acre DAP 75 kg /Acre Weed, pest & disease control	CAN or SA 15 g/m after second weeding Weed, pests & diseases control	Harvest 60 days after direct sowing 30 days after transplanting Harvesting & marketing can continue up to 6 months	Peak demand for Black Night Shade			

A Sample of a BNS Planting Calendar

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q2 Cont'

- “Does the farmer prepare and use **crop planting calendar(s)** to plan production for the next cropping season?”
- A **crop planting calendar** is a tool for farmers to plan for production to ensure that marketing coincides with the period of the year when **the market price of a produce is highest**

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q2 Cont'

Summary of the Procedure of preparing Crop Planting Calendar (details in crop planting calendar topic)

1. Determine from the **market survey** results (**GHCP&PHHT 20: Q1**) when there is **peak demand** for selected crops
2. Work backward from the month when there is peak demand to prepare monthly farm activities preceding the peak period
3. Use the monthly activities preceding the peak as a procurement plan for farm inputs and a guide for farm operations

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q3



Soil sampling

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q3 Cont'

“Does the farmer undertake **soil testing at least once in two to three years?”**

- It is recommended to have the soils analyzed for **nutrient availability** and other factors vital to crop production after **every 2-3 years**
- The results of the **soil analysis** should be used **to determine fertilizer and manure requirement**

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q3 Cont'

- Establishing the **type** and **quantity** of fertilizer one needs to apply is vital in;
 - Increasing production
 - Avoiding making the soils either **too acidic** or **alkaline**
 - Saving expenditure on inputs thus **reducing the cost of production** and **increasing the profitability**

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q4

“Does the farmer use recommended composting practices by using different organic materials to supply major nutrients: Nitrogen (N), Phosphorus (P), and Potassium (K) in **preparing compost/farmyard manure?”**

- Due to significant role of manure in increasing crop productivity, farmers need to adopt more efficient methods of preparing the manure
- Adopting efficient methods of preparing manure will ensure **optimal application**, thus **increasing productivity**

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q5

2-3



Photos: SHEP PLUS

Assorted quality seeds

2. GHCP&PHHT20: Pre-Cultivation Preparation: Q5 Cont'

- “Does the farmer use recommended **quality planting material(s)** with one or more of the following characteristics: disease resistance and tolerance, high yielding, early maturing, better tastes, size, and longer shelf life?”
- Use of **quality planting material(s)** can positively improve the returns of smallholder farmers for **2 major reasons**:
 - High yields
 - Less expenditure on control of pests and diseases
 - The overall effect is **higher net income**

3. GHCP&PHHT20: Land Preparation: Q6



Land preparation using a hoe (Jembe)

3. GHCP&PHHT20: Land Preparation: Q6 Cont'

- “Does the farmer use one or more of the following recommended **land preparation practices** in management of pests & diseases: Soil solarization, timely ploughing, appropriate depth of ploughing and minimum tillage?”
- **Land preparation** is critical in management of soil borne pests and diseases and the recycling of soil nutrients

3. GHCP&PHHT20: Land Preparation: Q6 Cont'

- Some of the recommended practices for management of soil borne pests and diseases are:
 - **Soil solarization**, especially in the establishment of the nursery
 - **Appropriate depth of ploughing** (The soil must be ploughed to a minimum depth of 30 cm)
 - **Timely ploughing**
 - **Exposure of pests** to desiccation
 - **Minimum movement of soil** to check on the spread of pests and diseases

3. GHCP&PHHT20: Land Preparation: Q7

3-2



Photo: SHEP PLUS

Incorporation of crop residues

3. GHCP&PHHT20: Land Preparation: Q7 Cont'

“Does the farmer **incorporate** appropriate **crop residues** at least two months before planting to enhance recycling of nutrients?”

- **Incorporating crop residues** into the farm is a sustainable means of recycling the soil nutrients and structure
- The crop residues should be incorporated to a depth of **30 cm** at least **2 months** before planting to allow decomposition
- The crop residues should be **chopped into smaller pieces** to hasten the decomposition process
- Diseased material should be **discarded to avoid possible risk of disease build-up**

3. GHCP&PHHT20: Land Preparation: Q8

3-3



Photo: SHEP PLUS

Weighing manure at Waruihu ATC before application

3. GHCP&PHHT20: Land Preparation: Q8 Cont'

“Does the farmer incorporate compost/farmyard manure/organic fertilizers as a **basal application at least 1-2 weeks before planting?”**

- The release of nutrients from farmyard manure (FYM)/compost is a slow process
- FYM/compost should be applied **1 – 2 weeks before planting or transplanting**
- FYM/compost **should never be exposed to direct sunlight** as the material tend to lose nitrogen through volatilization

3. GHCP&PHHT20: Land Preparation: Q8 Cont'

- The applied FYM/compost should be **broadcasted** then **worked into the soil**
- Use of partially decomposed FYM/compost **should be avoided** as this tends to compound the problem of soil borne pests and diseases

4. GHCP&PHHT20: Crop Establishment: Q9



Nursery of leafy vegetables

4. GHCP&PHHT20: Crop Establishment: Q9 Cont'

“Does the farmer use **recommended practices in raising seedlings** or use seedlings raised from **registered nursery(s)**?”

- **Raising healthy seedlings** should be the ultimate goal of every farmer
- This should start with appropriate location of the nursery
- The nursery should be located at a site that has not been planted with crops in the family of the seedlings to be raised for **at least 3 years**

4. GHCP&PHHT20: Crop Establishment: Q9 Cont'

- Sterilization of the nursery site through **solarization** is a feasible option for smallholder farmers
- Conditions that are likely to predispose seedlings to pest and diseases, such as **overcrowding**, **dampness** and **excessive shading** should be avoided
- Seedlings should be **hardened 1 – 2 weeks before transplanting** by reducing the frequency of watering and the shading
- Other than on-farm, seedlings should only be sourced from **registered and certified nurseries**
- **Seed dressing can be an option to control soil/ seed borne pests and diseases** (Refer to the latest **PCPB** list for specific products appropriate for specific crops)
 - Thiamethoxam + Metalaxyl –M + Difenoconazole (APRON STAR®)
 - Imidacloprid (MURTANO®, MONCERN®)
 - Thiram (THIRAM 80WP®)

4. GHCP&PHHT20: Crop Establishment: Q9 Cont'



Photo: SHEP PLUS

Seedling tray is a good option for growing healthy seedlings effectively.

4. GHCP&PHHT20: Crop Establishment: Q10

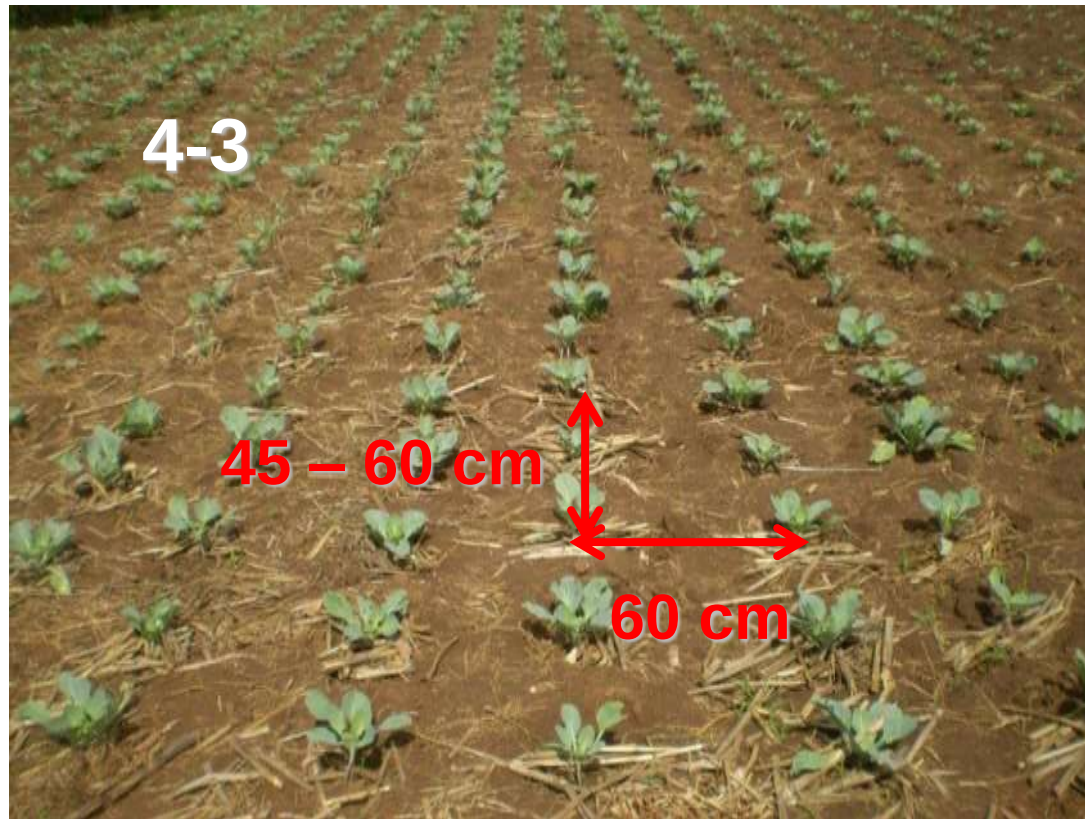


Photo: SHEP PLUS

Cabbage crop 2 weeks after transplanting

4. GHCP&PHHT20: Crop Establishment: Q10 Cont'

“Does the farmer use recommended **planting/transplanting spacing?”**

- Seedlings should be transplanted at the recommended **spacing** and **stage** (check the label of the seed packet. Each crop has its own optimal population.)
- Right spacing **minimizes pest and disease incidences, ease farm operation and has the overall effect of improved productivity**
- Avoid transplanting **immature and over grown seedlings** as they will have poor take off
- **Line planting/transplanting** using a string makes field operations easier

4. GHCP&PHHT20: Crop Establishment: Q11

“Does the farmer plant/transplant using recommended **fertilizer type and application rates**?”

- Adhere to the recommended **planting/transplanting fertilizer application rates**
- Inorganic fertilizers (DAP, SSP, DSP, TSP NPK etc.) should thoroughly be mixed with the soil to avoid scorching or volatilization of nitrogen based fertilizers
- The effectiveness of fertilizers is highly dependent on **soil pH**, therefore, it is recommended to have **the soils analyzed** periodically so as to determine the type and quantity of fertilizer to apply

5. GHCP&PHHT20: Crop Management: Q12



**Drip irrigation for
greenhouse
tomato**



**Cabbage crop being
irrigated using a
sprinkler jet**

5. GHCP&PHHT20: Crop Management: Q12 Cont'

“Does the farmer supplement **water through one or more of the following irrigation methods: watering can, overhead, drip, basin, and furrow?”**

- Amount of water required to grow different crops varies, thus, it is important to know appropriate amount of water to grow specific crops
- Among different irrigation methods, Drip Irrigation is the best option for effective utilization of limited amount of water

5. GHCP&PHHT20: Crop Management: Q12 Cont'

Crop	Water Requirement (mm)
Tomato	600-800
Irish Potato	500-700
Onion	350-550
Chili	500
Cabbage	380-500
Pea	350-500
Banana	1,200-2,200

Source: Liniger H, 1995: Endangered Water

5. GHCP&PHHT20: Crop Management: Q12 Cont'

- Factors to consider when choosing an irrigation system: **terrain, soil type, available amount of water, type of crop** (whether the crop is a fruit bearing or vegetative), **cost, technical know-how, and climatic conditions**
 - **Furrow irrigation** is preferred to Overhead/sprinkler irrigation in areas with high prevalence of “Early & Late Blight” of Tomato
 - For fruit bearing and flowering crops, **furrow and drip irrigation** are preferred over overhead/sprinkler irrigation

5. GHCP&PHHT20: Crop Management: Q12 Cont'

- Irrigation water should be applied as per the recommendations
- The quality of water should be appropriate for irrigation
- Irregular application of irrigation water can lead to defects such as “**Blossom-end Rot**”, **toughness, strong flavor, cracking, irregular fruit shape** and **poor tip filling**
- Inadequate water leads to **water stressed crops** with **significantly reduced yield**

5. GHCP&PHHT20: Crop Management: Q13



Weeding Kales using simple tools

5. GHCP&PHHT20: Crop Management: Q13 Cont'

“Does the farmer ensure **timely weeding** and use of appropriate weeding practices in **managing weeds**?”

- Weeds are **suppressive to crop yields & alternative host to many pests and diseases**
- More often, smallholder farmers unintentionally aid in weed proliferation by either weeding seeded weeds; or chopping the weed into smaller propagules for the vegetatively propagated weeds

5. GHCP&PHHT20: Crop Management: Q13 Cont'

- **Timely weeding** needs to be undertaken regularly in order to suppress the weeds
- Weeding when the farm is too wet should be avoided as it **leads to compaction**
- Use of **appropriate herbicides** cuts down on labour (costs) and improves farmers' income

5. GHCP&PHHT20: Crop Management: Q14

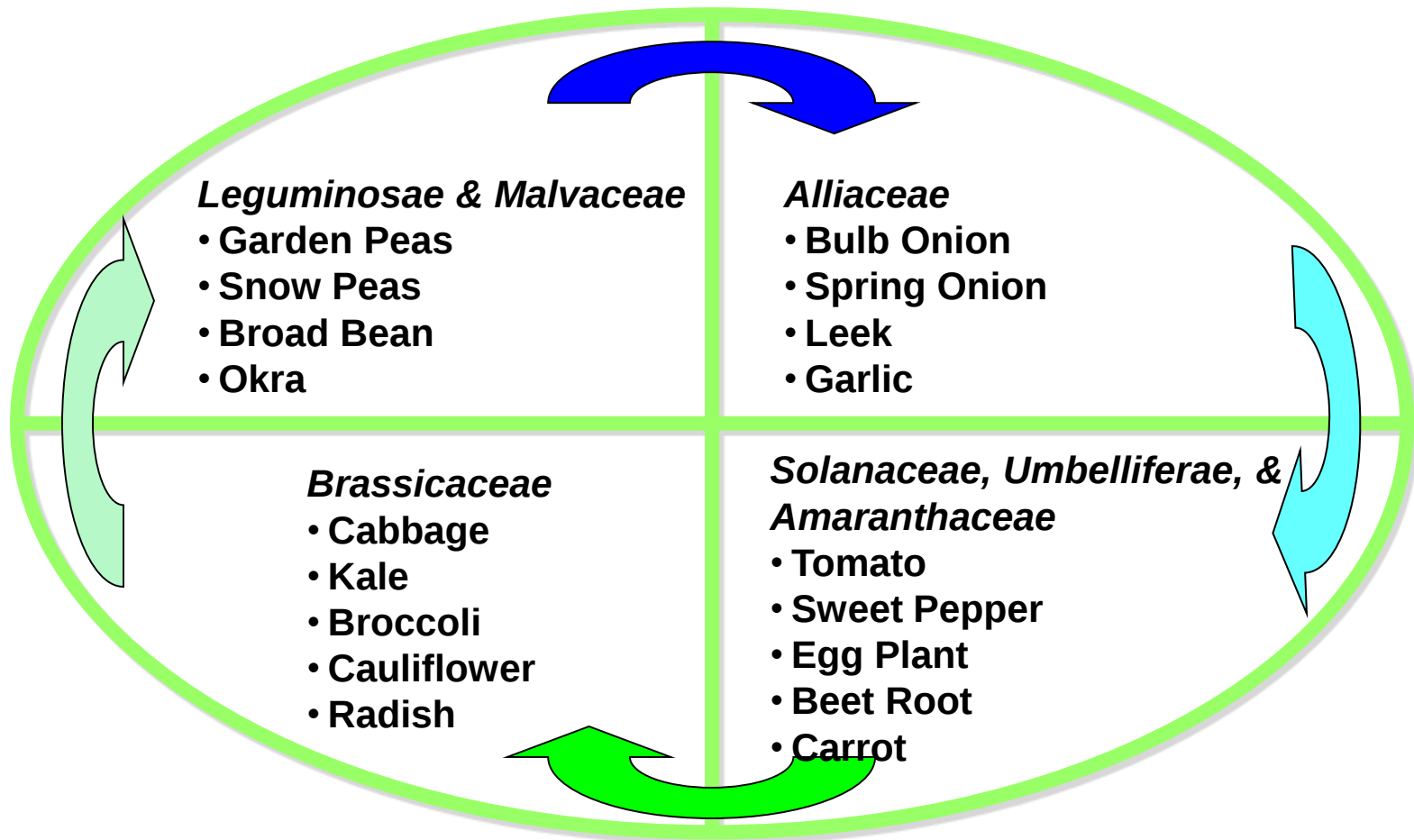
“Does the farmer undertake appropriate **top-dressing** practices: timeliness, type and recommended rate of application, and method of application?”

- Top-dressing fertilizers are essential for **vigorous crop growth** and **better yields**
- The fertilizers must be applied appropriately in terms of **timing, type, quantity** and **method**
- Source fertilizers from **reputable outlets/dealers**

5. GHCP&PHHT20: Crop Management: Q14 Cont'

- Top-dressing fertilizers should be applied **when the root system of the seedling is well established** to enable faster uptake by the crop
- Top-dressing fertilizers can be applied through **placement methods** or **fertigation method**

5. GHCP&PHHT20: Crop Management: Q15



An example of a Crop Rotation

5. GHCP&PHHT20: Crop Management: Q15 Cont'

“Does the **farmer use at least two of the following Integrated Pest Management (IPM):** cultural, biological, physical, and chemical?”

- **Pests and diseases** can be better managed through an **integration of 2 or more methods**
- The single control strategies are:
 - **Cultural**
 - **Physical**
 - **Biological**
 - **Chemical**

5. GHCP&PHHT20: Crop Management: Q15 Cont'

Cultural Control:

- Involves managing the environment in which the crop is growing/grows with a view of maintaining pest and disease below the harmful level
- The cultural methods include: **field sanitation/hygiene** (e.g. footbath), **intercropping**, **crop rotation**, **weeding**, **fallow**, **flooding**, **solarization**, **resistant/tolerant varieties**, **trap plants**, **push and pull system** (e.g. use of Marygold crop to repel nematodes (push) etc.

Physical Control

- Physical control involves use of **insect traps**, **hand picking**, **screen house**, and **barriers** etc.

5. GHCP&PHHT20: Crop Management: Q15 Cont'

Biological Control

- This involves use of **natural enemies** (predators and parasitoids)
- Parasitoids live on the host pest where they complete their life cycle e.g. Parasitoid *Diadegma semiclausum* to control Diamond Back Moth in brassicas. Major parasitoid for aphids is a parasitic wasp called *Diaeretiella rapae*
- Pathogens include fungi, bacteria and viruses which attack pests in the field. Commercial products available include *Bacillus thuringiensis* (Bt) which is used to control caterpillars

5. GHCP&PHHT20: Crop Management: Q15 Cont'

Chemical Control

- This involves use of **pesticides**
- Pesticides have **quick knock down effect**
- Pesticide usage has been linked to environmental degradation and should be used as last resort

Integrated Pest Management (IPM)

- Due to limitation of a single control strategy, use of IPM is a more recommended strategy
- IPM integrates **cultural, mechanical, biological** and as a last resort, **chemical control** to minimize the crop loss caused by pests and diseases

5. GHCP&PHHT20: Crop Management: Q16



5-6



Putting on protective clothing before application of pesticide

5. GHCP&PHHT20: Crop Management: Q16 Cont'

“Does the farmer observe **safe and effective use of pesticides**: protective clothing, recommended pesticides, appropriate doses, appropriate disposal and Pre-Harvest Interval (PHI)?”

- Pesticides are **harmful** both to people and the environment
- This has led to restriction and ban of some pesticides e.g. methyl bromide, dimethoate

5. GHCP&PHHT20: Crop Management: Q16 Cont'

- **To minimize the negative effect of pesticides,** there is need for smallholder farmers to be sensitized on aspects such as:
 - Recommended pesticides
 - Dosage
 - Re-entry interval
 - Pre-Harvest Interval (PHI)
 - MRLs
 - Appropriate usage of pesticides application devices
 - Storage
 - Protective clothing

6. GHCP&PHHT20: Harvest: Q17



Harvesting Cabbages

6. GHCP&PHHT20: Harvest: Q17 Cont'

“Does the farmer use at least one of the following **harvesting indices**: color, size, shape, and firmness?”

- The shelf life of a produce is **highly correlated** to the physiological and horticultural maturity at harvesting
- Understanding the **unique characteristics** of different produce at physiological and horticultural maturity is vital in ensuring that **only mature produce is harvested**
- This greatly reduces **the post-harvest losses** associated with produce harvested prematurely

6. GHCP&PHHT20: Harvest: Q17 Cont'

- Harvesting indices for different produce:
 - **Color of the skin & seeds** (e.g. Tomato, Chili and Passion Fruits)
 - **Size of leaves & fruits** (e.g. Kale, and Pineapple)
 - **The way the fruit sounds when thumped** (e.g. Watermelon, Melon and Cabbage)
 - **Shape of produce** e.g. mature bananas are more rounded

7. GHCP&PHHT20: Post-Harvest Handling: Q18



Tomatoes packaged in wooden crates

7. GHCP&PHHT20: Post-Harvest Handling: Q18 Cont'

“Does the farmer use **post-harvest handling containers** with the following characteristics: well ventilated, easy to clean, and smooth?”

- Post-harvest handling greatly influence the **produce quality, shelf life** and **post-harvest losses**
- There is need for **appropriate post-harvest handling** of produce in terms of: **cooling, sorting, grading, cleaning, packaging, transportation** and **storage**

7. GHCP&PHHT20: Post-Harvest Handling: Q19



Graded French beans in a pack house

7. GHCP&PHHT20: Post-Harvest Handling: Q19 Cont'

“Does the farmer apply one of the following recommended **value addition techniques**: sorting, grading, cleaning, packaging, or processing of the produce?”

- Markets for fresh produce have become **increasingly competitive** in terms of the produce quality
- There is need for farmers to add value to their produce in terms of presentation and processing for the products to be competitive
- Value addition techniques that are compatible with **the cottage industry** should be promoted for **smallholder farmers**

8. GHCP&PHHT20: Cost & Income Analysis: Q20

Crop: TomatoSub-county: Kirinyaga EastFarmer's Name: John MuiruriArea Under Production: 1 acreMarket(s): Soko MjingaGroup Name: Kioneki SHGPeriod: from 07/2016 (MM/YYYY) to 12/2016 (MM/YYYY)

Gross Income (A)

Item	Quantity	Unit Price	Total (KSH)
Tomato	7,500kg	30	225,000
Subtotal (A)			225,000

Variable costs (B)

Item	Quantity	Unit Cost	Total (KSH)
Land Preparation	1acre	2,500	2,500
Seeds		5,000	5,000
Fertilizers (DAP)	1.5 Bag	3,000	4,500
(CAN)	2 Bags	1,600	3,200
Fungicides (Dithane M45)	2kg	800	1,600
Insecticides (Karate)	1kg	1500	1,500
Subtotal (B)			18,300

Labour costs (C)

Item	Quantity	Unit Cost	Total (KSH)
Planting	10 md	250	2,500
Fertilizer	8 md	250	2,000
Weeding(1)(2)	15 md	250	3,750
Spray	8 md	250	2,000
Harvesting	200 md	250	50,000
Grading	-	-	-
Transportation			
Packaging	-	-	-
Subtotal (C)			60,250

Other Costs (D)

Item	Quantity	Unit Cost	Total (KSH)
Transportation	-	-	0
Packaging			
Subtotal (D)			0

Net Profit = A-(B+C+D)

$$225,000 - (18,300 + 60,250 + 0) = 146,450$$

8. GHCP&PHHT20: Cost & Income Analysis: Q20 Cont'

“Does the farmer keep **farm records** to determine the profitability of the enterprise(s)?”

- Viable decisions on any enterprise can only be based on **accurate data** or **information**
- Such decisions are largely based on **the income generated**
- Most smallholder farmers rarely keep records; subsequently, most decisions are **abstract, highly subjective** and **not economically viable**
- There is need to sensitize smallholder farmers on the importance of **keeping accurate farm records** in making economically viable decisions

Reference

- Infonet Biovision

<http://www.infonet-biovision.org/>

THANK YOU
ASANTE SANA
DOMO ARIGATO
GOZAIMASU

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