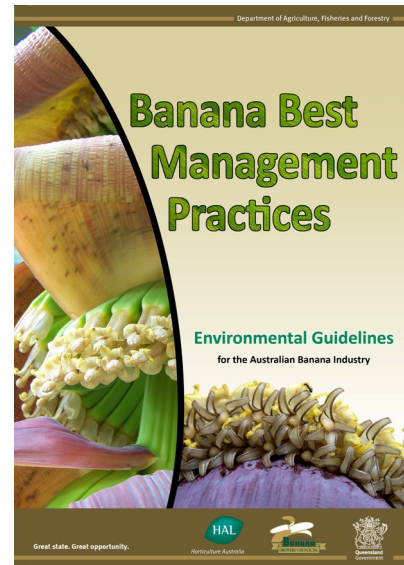


Banana Best Management Practices Environmental Guidelines

Online-Training Instructions



The Banana Best Management Practices (BMP) Environmental Guidelines have been developed in partnership between DAFFQ, ABGC and HAL. The information has been largely developed and validated by a reference group of 13 banana growers, whose involvement and enthusiasm for the project are gratefully appreciated and acknowledged. There has also been significant input from industry consultants and service providers to ensure that the content is precise and practical.

The Banana BMP has two main functions. Firstly, it provides a system for banana growers to be able to assess their farming practices and identify what their priority actions are. Secondly, it provides the resource material that gives practical information for growers to assist with practice change.

The Banana BMP is essentially a 3 step process.

- STEP 1 Self assessment checklist – where you can assess your farming practices
- STEP 2 Management Plan – identify your action items or priorities for change
- STEP 3 Resources – information to help change

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Accessing the Banana BMP

The Banana BMP is available as either a hardcopy or online system. These training instructions have been developed to assist users of the online system.

Logging on

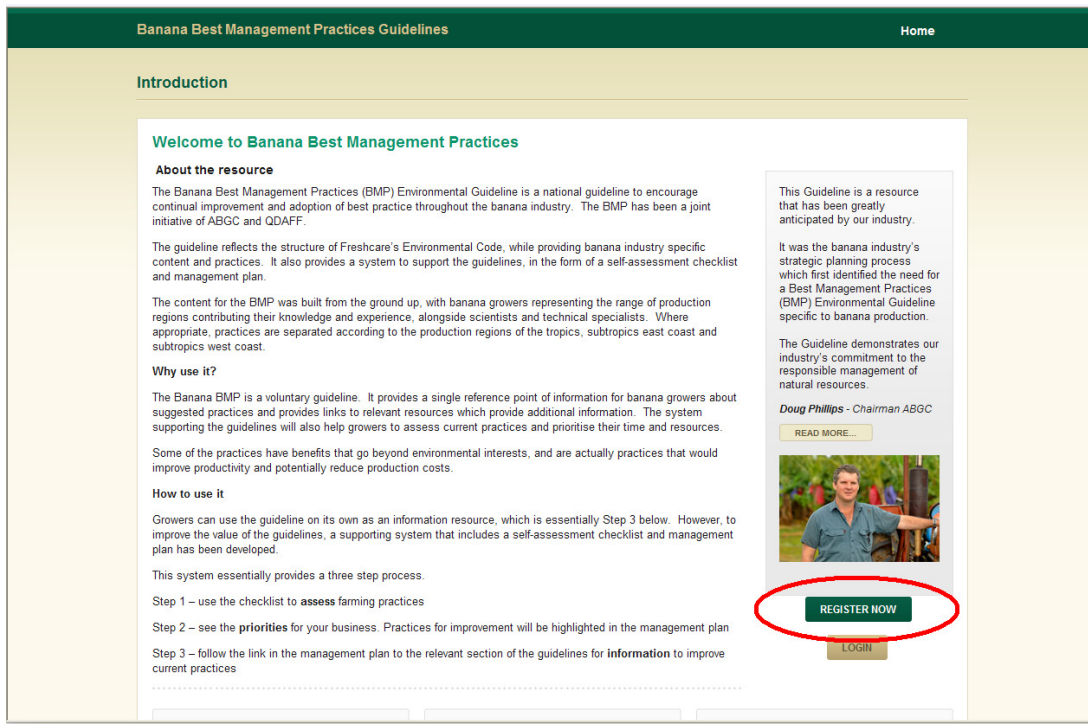
1. Open the Australian Banana Growers' Council webpage abgc.org.au

Before you start using the Banana BMP you will need to register your details. It's easy and all done online. After your registration has been approved you will have a user name and password that you can use to log in whenever you want to use the BMP. All the information from your sessions will be stored so you can refer to it the next time you log in.

To register, scroll to the bottom of the ABGC website's home page and select the Banana BMP icon. You will be directed to the home page of the Banana BMP which will provide an overview of the BMP and also a Foreword from ABGC Chairman, Doug Phillips.



2. On the bottom, right hand side of the screen click “REGISTER NOW”.



A registration box will appear asking for a username and other details. Your username should be your full name for example, Greg Grower. The format is up to you – your user name can be all lower case or have some capital letters. Your user name can be one word or more. Fill in the other details – your first and last names, property address, email and password. Please note, an email address can only be linked to one username.

REGISTER

Register For This Site

Username

First name

Last name

Property Address

E-mail

Password

Confirm Password

Register

Login

Lost Password

When you submit your registration you will be advised that the registration has been successful but must be approved by an administrator. When approved you will be able to return to the website and start using the BMP site by going to the “LOGIN”

button. The button is on the BMP home page and is located under the “REGISTER NOW” button.

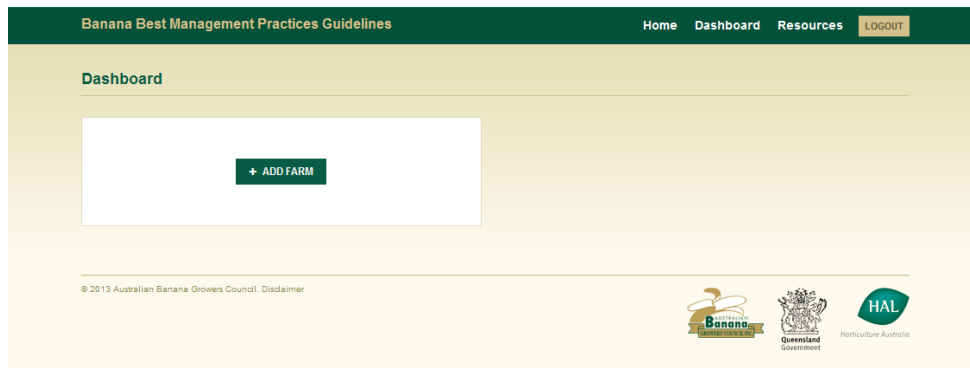


3. **On the login page, enter your username and password, then select “Log In”.** Please note, both the username and password are case sensitive.

4. **After you login you will see the page below asking you to add details about your farm.**

This page is called the Dashboard. It will become the central place to navigate around the BMP

Start by clicking on the “+ add farm” icon. If you have more than one farm, continue this process for each individual farm.



5. In the first text box - type your farm name

6. In the second text box - your farm size in hectares

7. In the third text box – your farm postcode

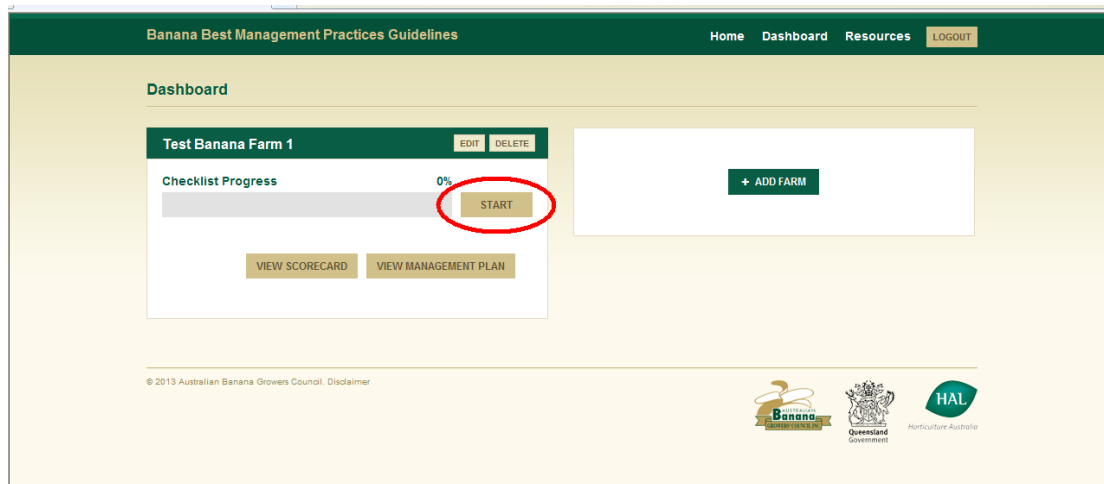
8. Once you have entered these details click “SAVE”

Your farm is now created. If you have more than one farm, continue this process for each individual farm. While most practices may be the same across your farms, differing soil types, climates, water sources and systems will mean some practices may vary. By separating the farms it allows you to assess each individually.

NB. Individual grower information will not be used by the industry and this will remain confidential at all times. The industry will use combined information for the purposes of determining priority areas for industry activities and monitoring practice change at a national and regional level.

STEP 1 – Self-assessment checklist

9. Click on the “START” icon and this will direct you to the checklist which is Step 1, of the BMP process



Once you have commenced the checklist you can return to this dashboard at any time and the ‘start’ icon will now be replaced by a ‘continue’ icon. This will still take you directly to the checklist. This screen also provides quick access to the scorecard and management plan.

If you have multiple farms, you are able to switch between the farms by returning to the dashboard and selecting a different farm.

10. Go through the checklist and answer each question according to the practices you use on your farm. At the end of each page click “SAVE & NEXT”

3. Cultivation method and timing land preparation

<input type="radio"/> The row only is cultivated at the times of year when the risk of erosion is low.	Best
<input type="radio"/> The whole block is cultivated at the times of year when the risk of erosion is low.	Okay
<input type="radio"/> The whole block is cultivated at any time of year.	Improve
<input type="radio"/> N/A	N/A

4. Cultivation method and timing – crop destruction

<input type="radio"/> The banana crop is removed by treating with herbicide and plants are left to break down before cultivation.	Best
<input type="radio"/> Practices are implemented to breakdown plants while minimising soil disturbance, for example, using a mulcher or lightly with the discs.	Okay
<input type="radio"/> The banana crop is removed by discing green plant material repeatedly.	Improve
<input type="radio"/> N/A	N/A

CANCEL SAVE & CLOSE **SAVE & NEXT**

The Banana BMP is made up of 10 modules, largely reflecting the layout of Freshcare's Environmental Code. When you open the checklist, you will see all of the 10 modules along the top. The order you choose to complete the checklist is completely up to the user. If you want to focus on the areas that you think are priorities for your business and region, then you can complete these first.

Once you select a module by clicking on the tab, the sub-modules will become visible. Again it is up to the user to choose which sub-modules to complete. The program default will take the user to the 'Soil' module working in chronological order through the modules and sub-modules.

11. There are two types of questions, either single answer or multiple answer questions.

The single answer questions are identifiable by the round character marker. While the multiple answer questions are visible by the phrase 'tick all that apply' and the square character marker. Your overall rating depends on how many practices you select.

Banana Best Management Practices Guidelines
Currently working on Test Banana Farm 1 ([Change](#)) [Home](#) [Dashboard](#) [Resources](#) [LOGOUT](#)

Checklist (0%)

1. Soil 2. Pesticides 3. IPDM 4. Fertiliser 5. Water 6. Biodiversity 7. Waste 8. Air 9. Energy 10. Fuel

1. Soil

1.1 – Soil structure
1.2 – Soil erosion
1.3 – Soil acidity and alkalinity

[VIEW SCORECARD](#)
[VIEW MANAGEMENT PLAN](#)
[PRINT ENTIRE CHECKLIST](#)

Soil structure

1. Crop rotation

☒ Either a volunteer grass fallow or a fallow crop is planted between banana crop cycles. *Best*

☐ A weedy fallow grows between banana crop cycles or the block is rotated with another crop. *Okay*

☐ There is no fallow period between banana crop cycles or bare fallow is left between crop cycles. *Improve*

☐ N/A *N/A*

2. Which of these practices do you use to increase organic matter levels?
Best = 6+ Okay = 4+ Improve = 3 or less.

☒ Fallow crops are grown between banana crops.

☒ Harvested heads and leaves are left on the row.

☐ Products are applied to increase organic matter such as manures/mulch/compost/mill mud.

☒ High nitrogen rates are avoided.

☐ Cultivation is reduced.

☒ A side-throw slasher or similar is used to put mulch back on the row.

☐ Banana waste scraps are spread back onto the rows.

☐ Non-competitive companion crops are encouraged around banana plants.

- 12. When completing the checklist, you will notice on the right-hand-side the practices fall into 3 categories of Best, Okay and Improve.**

Anything that is selected in the improve category will automatically be added to your management plan.

Banana Best Management Practices Guidelines
Currently working on Test Banana Farm 1 ([Change](#)) [Home](#) [Dashboard](#) [Resources](#) [LOGOUT](#)

Checklist (0%)

1. Soil 2. Pesticides 3. IPDM 4. Fertiliser 5. Water 6. Biodiversity 7. Waste 8. Air 9. Energy 10. Fuel

1. Soil

1.1 – Soil structure
1.2 – Soil erosion
1.3 – Soil acidity and alkalinity

[VIEW SCORECARD](#)
[VIEW MANAGEMENT PLAN](#)
[PRINT ENTIRE CHECKLIST](#)

Soil structure

1. Crop rotation

☒ Either a volunteer grass fallow or a fallow crop is planted between banana crop cycles. *Best*

☐ A weedy fallow grows between banana crop cycles or the block is rotated with another crop. *Okay*

☐ There is no fallow period between banana crop cycles or bare fallow is left between crop cycles. *Improve*

☐ N/A *N/A*

2. Which of these practices do you use to increase organic matter levels?
Best = 6+ Okay = 4+ Improve = 3 or less.

☒ Fallow crops are grown between banana crops.

☒ Harvested heads and leaves are left on the row.

☐ Products are applied to increase organic matter such as manures/mulch/compost/mill mud.

☒ High nitrogen rates are avoided.

☐ Cultivation is reduced.

☒ A side-throw slasher or similar is used to put mulch back on the row.

- 13. You can monitor your progress through the checklist two ways.**

You can see how much of the checklist has been completed by looking at the top of the page to the percentage in brackets. This tells you what percentage, of the total number of questions have been answered. Also, once an entire module has been answered, a tick will appear in the small box located next to the module name.

Banana Best Management Practices Guidelines
Currently working on Test Banana Farm 1 (Change) Home Dashboard Resources LOGOUT

Checklist (29%)

1. Soil ✓ 2. Pesticides ✓ 3. IPDM 4. Fertiliser 5. Water 6. Biodiversity 7. Waste 8. Air 9. Energy 10. Fuel

3. IPDM

3.1 – Nematodes

3.2 – Banana weevil borer

3.3 – Spider mites

3.4 – Leaf diseases – yellow Sigatoka, leaf speckle, leaf rust

Nematodes

1. Which of the practices listed below do you use to manage plant-parasitic nematodes?

Tick all that apply. Best = 3+ Okay = 2+ Improve = 1 or less.

☐ Only tissue culture or clean (and dipped) plant material is used.

☐ At the end of the crop cycle, banana plants are removed with glyphosate to eradicate all living plant material that could harbour plant-parasitic nematodes between crops.

☐ A fallow crop identified as a non-host for a particular plant-parasitic nematode is planted in the fallow period.

☐ Plant-parasitic nematode levels are monitored using the Root Disease Index (RDI) to determine when economic thresholds are met.

N/A

14. There is also an option to “PRINT ENTIRE CHECKLIST”.

This can be useful if you want to complete the checklist in your own time, away from the computer, and input your answers later.

Banana Best Management Practices Guidelines
Currently working on Test Banana Farm 1 (Change) Home Dashboard Resources LOGOUT

Checklist (29%)

1. Soil ✓ 2. Pesticides ✓ 3. IPDM 4. Fertiliser 5. Water 6. Biodiversity 7. Waste 8. Air 9. Energy 10. Fuel

2. Pesticides

2.1 – Integrated pest and disease management

2.2 – Chemical treatments

2.3 – Obtaining, storing, handling, applying and disposing of chemicals

2.4 – Spray drift

2.5 – Maintain and calibrate equipment

VIEW SCORECARD

VIEW MANAGEMENT PLAN

PRINT ENTIRE CHECKLIST

Chemical treatments

1. Monitoring

☒ Pest and disease levels are monitored on a regular and consistent basis by trained staff or service providers. Records are retained and treatments are applied using monitoring information and relevant threshold levels for each pest/disease. Best

☐ Pest and disease levels are monitored by general observations when doing other activities and control methods applied accordingly. Okay

☐ Spray treatments are applied on a calendar basis or in response to severe outbreaks. Improve

☐ N/A N/A

2. Chemical rotations

☐ A rotation program is in place to ensure products are applied correctly and rotated according to label instructions, to prevent resistance from developing. Best

☒ Attempts are made to rotate between chemical groups according to label instructions, but there is no rotation program in place. Okay

☐ Chemicals are not rotated to avoid resistance. Improve

☐ N/A N/A

3. Chemical registrations

☒ Key personnel know how to find which products are registered and permitted for use and only these products are used on-farm. Best

☐ Rely on reseller or consultant advice for product registrations and only registered and permitted products are used on-farm. Okay

☐ Not sure if the products used are registered or permitted for use. Improve

15. At any time during the process you can view your scorecard by clicking on the “VIEW SCORECARD” icon, located just above the ‘PRINT ENTIRE CHECKLIST’ icon.

Banana Best Management Practices Guidelines
Currently working on Test Banana Farm 1 ([Change](#)) [Home](#) [Dashboard](#) [Resources](#) [LOGOUT](#)

Checklist (29%)

1. Soil ☒ 2. Pesticides ☒ 3. IPDM ☐ 4. Fertiliser ☐ 5. Water ☐ 6. Biodiversity ☐ 7. Waste ☐ 8. Air ☐ 9. Energy ☐ 10. Fuel ☐

2. Pesticides

2.1 - Integrated pest and disease management

2.2 - Chemical treatments

2.3 - Obtaining, storing, handling, applying and disposing of chemicals

2.4 - Spray drift

2.5 - Maintain and calibrate equipment

[VIEW SCORECARD](#)

[VIEW MANAGEMENT PLAN](#)

[PRINT ENTIRE CHECKLIST](#)

Chemical treatments

1. Monitoring

☒ Pest and disease levels are monitored on a regular and consistent basis by trained staff or service providers. Records are retained and treatments are applied using monitoring information and relevant threshold levels for each pest/disease. *Best*

☐ Pest and disease levels are monitored by general observations when doing other activities and control methods applied accordingly. *Okay*

☐ Spray treatments are applied on a calendar basis or in response to severe outbreaks. *Improve*

☐ N/A *N/A*

2. Chemical rotations

☐ A rotation program is in place to ensure products are applied correctly and rotated according to label instructions, to prevent resistance from developing. *Best*

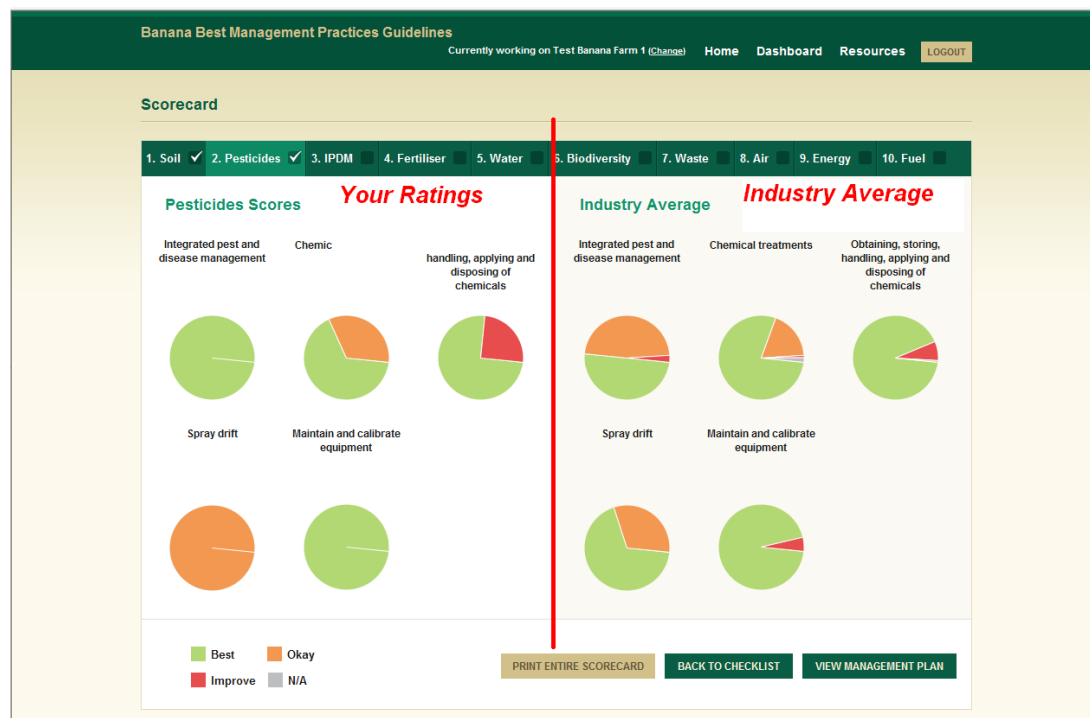
☒ Attempts are made to rotate between chemical groups according to label instructions, but there is no rotation program in place. *Okay*

☐ Chemicals are not rotated to avoid resistance. *Improve*

☐ N/A *N/A*

3. Chemical registrations

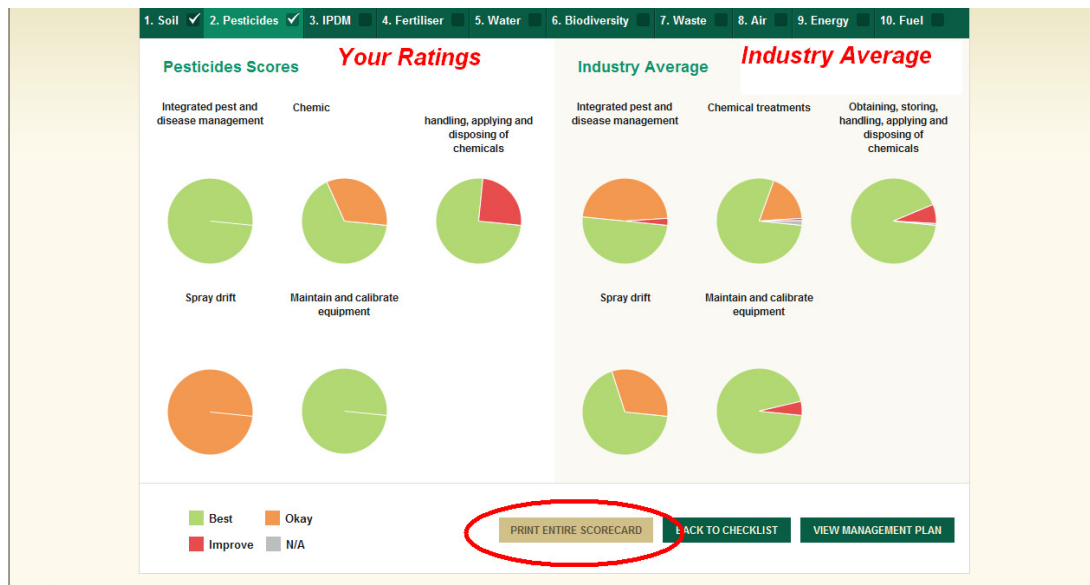
16. The scorecard provides a summary of your practice rating by module and sub-module



The left half of the screen illustrates your practice ratings while the right half of the screen allows you to compare your ratings with the industry average. You can choose the module to view by clicking on the module name along the top of the screen.

NB. These averages are a 12 month moving average across the whole industry.

17. It is possible to print your entire scorecard by clicking on the “PRINT ENTIRE SCORECARD” icon at the bottom of the page



STEP 2 – Management plan

18. You can view your management plan by clicking on the “VIEW MANAGEMENT PLAN” icon. This icon appears on the scorecard, checklist and dashboard pages.

All of the answers from the checklist that were in the “improve” category rating will automatically be added to your management plan.

Banana Best Management Practices Guidelines						
Currently working on Bens farm (Change)						
Home Dashboard Resources LOGOUT						
Management Plan						
All	To Do	Important	Complete			
Module/Submodule	Item for Improvement	Action Required	Responsible	Due		
1.1 – Soil structure Module: Soil	Which of these practices do you use to increase organic matter levels?				EDIT	MARK COMPLETE
1.2 – Soil erosion Module: Soil	Wind erosion (Western Australia only)				EDIT	MARK COMPLETE
3.4 – Leaf diseases – yellow Sigatoka, leaf speckle, leaf rust Module: IPDM	Which of the practices listed below do you use to manage yellow Sigatoka?				EDIT	MARK COMPLETE
4.3 – Nutrient budgeting Module: Fertiliser	Fertiliser program				EDIT	MARK COMPLETE
4.5 – Storing fertilisers Module: Fertiliser	Storing fertilisers				EDIT	MARK COMPLETE
5.1 – Efficient irrigation Module: Water	Manage salinity				EDIT	MARK COMPLETE
5.1 – Efficient irrigation Module: Water	Soil moisture monitoring	Irrigation schedules are based on capacitance probes or tensiometers and use a manual system.			EDIT	MARK COMPLETE
PRINT MANAGEMENT PLAN + ADD ITEM FOR IMPROVEMENT BACK TO CHECKLIST						

19. You can manually add items to your management plan by clicking “+ ADD ITEM FOR IMPROVEMENT”

This allows you to add items that may have been Okay but you would like to improve further, or actions not covered by the BMP to maintain a single management plan for the business

▲	1.2 – Soil erosion Module: Soil	Controlling run-off water – slowing water	Most blocks have been designed to slow surface water and direct it to an appropriate waterway, although some corrective work is still required.			EDIT MARK COMPLETE
▲	2.2 – Chemical treatments Module: Pesticides	Chemical registrations	Rely on reseller or consultant advice for product registrations and only registered and permitted products are used on-farm.			EDIT MARK COMPLETE
▲	2.2 – Chemical treatments Module: Pesticides	Chemical rotations	Attempts are made to rotate between chemical groups according to label instructions, but there is no rotation program in place.			EDIT MARK COMPLETE
▲	2.3 – Obtaining, storing, handling, applying and disposing of chemicals Module: Pesticides	Obtaining				EDIT MARK COMPLETE

PRINT MANAGEMENT PLAN **+ ADD ITEM FOR IMPROVEMENT** BACK TO CHECKLIST

20. By selecting the “EDIT” icon on an individual item line, you can add additional information such as: item for improvement, action required, person responsible and a due date. Then click “SAVE”

All	To Do	Important	Complete		
Module/Submodule	Item for Improvement	Action Required	Responsible	Due	
▲ 1.1 – Soil structure Module: Soil	Cultivation method and	The whole block is cultivated at the times of year when the risk of erosion is low.	Responsible Budget Progress	<input type="text"/> Ongoing <input type="text"/>	SAVE CANCEL
▲ 1.1 – Soil structure Module: Soil	Which of these practices do you use to increase organic matter levels?				EDIT MARK COMPLETE
▲ 1.2 – Soil erosion Module: Soil	Controlling run-off water – contouring	If the farm has areas under banana production with a gradient of 3% or more, most blocks in these areas have been planted along the contour and designed to include diversion banks and constructed waterways. Advice has been sought for placing these structures correctly. Annual maintenance is carried out to ensure these structures are operating correctly. Blocks are left undeveloped if erosion cannot be managed.			EDIT MARK COMPLETE
▲ 1.2 – Soil erosion Module: Soil	Controlling run-off water – slowing water	Most blocks have been designed to slow surface water and direct it to an appropriate waterway, although some			EDIT MARK

By populating the text boxes in this management plan, your business will have developed a list of action items for the business. This is a valuable tool for management decisions and also useful to show to external auditors if you are accredited under an Environmental Standard.

If you are unsure of how to correct a practice or what best practice is, refer to the resource material. Step 24 of these training instructions explains how to do this, or alternatively you can click on the “resources” tab at the top-right of screen to be taken to the resource section.

Banana Best Management Practices Guidelines

Currently working on Test Banana Farm 1 (Change) Home Dashboard **Resources** LOGOUT

Management Plan

All To Do Important Complete

	Module/Submodule	Item for Improvement	Action Required	Responsible	Due	
⚠	1.1 – Soil structure Module: Soil	Cultivation method and timing land preparation	The whole block is cultivated at the times of year when the risk of erosion is low.			EDIT MARK COMPLETE

- 21. To make an action item a high priority, click the faded exclamation mark in the triangle in the far left column.**

This action item will now appear under the “important” tab, which is the third tab along the top, out of a total of four tabs. This helps the business to keep track of their ‘high’ priority actions. When you return to the “all” tab (the first of the four tabs along the top) this item will also appear at the top of the list to help highlight the actions with higher priority ratings.

All To Do **Important** Complete

	Module/Submodule	Item for Improvement	Action Required	Responsible	Due	
⚠	1.1 – Soil structure Module: Soil	Cultivation method and	The whole block is cultivated at the times of year when the risk of erosion is low.	Responsible <input type="text"/> Budget <input type="text"/>	<input type="text"/> Ongoing Progress <input type="text"/>	SAVE CANCEL
⚠	1.1 – Soil structure Module: Soil	Which of these practices do you use to increase organic matter levels?				EDIT MARK COMPLETE
⚠	1.2 – Soil erosion Module: Soil	Controlling run-off water – contouring	If the farm has areas under banana production with a gradient of 3% or more, most blocks in these areas have been planted along the contour and designed to include diversion banks and constructed waterways. Advice has been sought for placing these structures correctly. Annual maintenance is carried out to ensure these structures are operating correctly. Blocks are left undeveloped if erosion cannot be managed.			EDIT MARK COMPLETE
⚠	1.2 – Soil erosion Module: Soil	Controlling run-off water – slowing water	Most blocks have been designed to slow surface water and direct it to an appropriate waterway, although some			EDIT MARK

- 22. When an action item is complete, click on the “MARK COMPLETE” icon in the right hand column and enter the appropriate date, then click “SAVE”**

Banana Best Management Practices Guidelines

Currently working on Test Banana Farm 1 (Change) Home Dashboard Resources LOGOUT

Management Plan

All	To Do	Important	Complete		
Module/Submodule	Item for Improvement	Action Required	Responsible	Due	
1.1 – Soil structure Module: Soil	Cultivation method and timing land preparation	The whole block is cultivated at the times of year when the risk of erosion is low.			EDIT MARK COMPLETE
1.1 – Soil structure Module: Soil	Which of these practices do you use to increase organic matter levels?				EDIT MARK COMPLETE
1.2 – Soil erosion Module: Soil	Controlling run-off water contouring	If the farm has areas under banana production with a gradient of 3% or more, most blocks in these areas have been planted along the contour and designed to include diversion banks and been sought Annual these blocks are left managed.			EDIT MARK COMPLETE
1.2 – Soil erosion Module: Soil	Controlling run-off water slowing water	slow surface waterway, if required.			EDIT MARK COMPLETE
2.2 – Chemical treatments Module: Pesticides	Chemical registrations	Rely on reseller or consultant advice for product registrations and only registered and permitted products are used on-farm.			EDIT MARK COMPLETE
		Attempts are made to rotate between chemical			EDIT

Completion Date: 05/11/13

Cancel Save

This completed action item will now appear under the “complete” tab which is the fourth and final tab along the top. This helps the user to easily identify all of the completed projects. When you return to the “all” tab (the first of the four tabs along the top), this action item will be ‘greyed out’ and moved to the bottom of the list. An item marked as ‘complete’ can be resumed at any time to reactivate it.

Banana Best Management Practices Guidelines

Currently working on Test Banana Farm 1 (Change) Home Dashboard Resources LOGOUT

Management Plan

All	To Do	Important	Complete	
Module/Submodule	Item for Improvement	Action Required	Responsible	Due
1.1 – Soil structure Module: Soil	Which of these practices do you use to increase organic matter levels?			Completed 05/11/13 RESUME

PRINT MANAGEMENT PLAN + ADD ITEM FOR IMPROVEMENT BACK TO CHECKLIST

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Banana Queensland Government HAL Horticulture Australia

23. The management plan can be printed by clicking the “PRINT MANAGEMENT PLAN” icon appearing on the lower left side of the page.

2.2 – Chemical treatments Module: Pesticides	Chemical rotations	Attempts are made to rotate between chemical groups according to label instructions, but there is no rotation program in place.			COMPLETE EDIT MARK COMPLETE
2.3 – Obtaining, storing, handling, applying and disposing of chemicals Module: Pesticides	Obtaining				EDIT MARK COMPLETE

PRINT MANAGEMENT PLAN + ADD ITEM FOR IMPROVEMENT BACK TO CHECKLIST

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Banana Queensland Government HAL Horticulture Australia

STEP 3 – Resource material

24. For information about best practice for a particular action item, click on the blue hyperlink (second column).

This will take you directly to the relevant section in the resource document for further information.

Banana Best Management Practices Guidelines				
Currently working on Test Banana Farm 1 (Change) Home Dashboard Resources LOGOUT				
Management Plan				
All	To Do	Important	Complete	
Module/Submodule	Item for Improvement	Action Required	Responsible	Due
1.1 - Soil structure Module: Soil	Cultivation method and timing land preparation	The whole block is cultivated at the times of year when the risk of erosion is low.		
1.1 - Soil structure Module: Soil	Which of these practices do you use to increase organic matter levels?			
		If the farm has areas under banana production		

25. Similar to the checklist and scorecard, you can use the module names along the top to navigate around the resource material. Once a module has been selected you can choose the appropriate sub-module from the list on the left.

To return to the management plan click on the green “BACK TO MANAGEMENT PLAN” icon on the lower, left-hand side of the screen.

1 – Soil	Soil structure
Introduction	Soils are classified into a range of soil classes. Bananas grown in better class soils have higher yields and are more profitable. Bananas prefer soils that are not prone to water logging. They should be free-draining, have good internal structure and be suitable for cultivation. It is important to understand the soil types on your farm, their characteristics and the best way to manage them. Select farming practices that will maintain or improve soil structure to ensure optimal productivity.
1.1 – Soil structure	Crop rotation Planting a fallow crop in between each banana crop rotation helps to maintain or improve the soil structure. In any fallow period, it is important to kill volunteer bananas as they can harbour pests and diseases from one crop rotation to the next. The longer the block can be left fallow, the better for soil health. Ideally, blocks should be left with a fallow crop for a minimum of 12 months. A break in production, by introducing a fallow crop, is important for: <ul style="list-style-type: none"> Banana pest control – introducing a crop that is not a host banana for pests such as banana weevil borer or plant-parasitic nematodes, breaks the pest life cycle, effectively removing them from the block. Soil biology – introducing a new crop encourages a diversity of microorganisms and maintains an environment that is conducive to growth, as an active root system is required for a healthy food web. Organic matter – incorporating fallow crops into the crop rotation helps to improve soil organic matter levels. Erosion protection – a fallow crop provides soil cover and protection against the impacts of rainfall and surface water runoff.
1.2 – Soil erosion	<p>Selecting the fallow crop in a banana rotation depends largely on two factors:</p> <ul style="list-style-type: none"> the presence or absence of plant-parasitic nematodes the length of time the block will be left fallow <p>If plant-parasitic nematodes are present, it is important to identify which nematodes cause the main economic problem. There may be more than one type of nematode present, but the nematode likely to have the largest economic impact is the highest priority. For more information on managing nematodes, refer to the module on banana pest and disease management.</p> <p>If plant-parasitic nematodes are not present, select the fallow crop by simply choosing a crop that suits the climatic conditions and will provide maximum organic matter. In the tropics, suitable crops are sorghum and Rhodes grasses. In the east coast subtropics, molasses grass, lotononis and broadleaf paspalum are suitable, while in the west coast subtropics, crops such as sorghum are also suitable but they will need to be irrigated.</p> <p>If a fallow crop cannot be planted, volunteer grass or a weedy fallow is preferable to a bare fallow as it will still protect the soil from erosion and provide an active root zone for microorganisms. Bear in mind, however, that it could continue to host</p>
1.3 – Soil acidity and alkalinity	
1.4 – Salinity	
1.5 – Acid sulphate soils	
1.6 – Sodicity	
1.7 – Soil contamination	
More Information	
BACK TO MANAGEMENT PLAN	
PRINT ALL RESOURCES	
DOWNLOAD FLOW CHART	

26. Where more information is available on other websites, a blue hyperlink will be included in the text. Click on the link and it will take you directly to the relevant website.

Banana Best Management Practices Guidelines

Home Dashboard Resources **LOGOUT**

Resources

1. Soil 2. Pesticides **3. IPDM** 4. Fertiliser 5. Water 6. Biodiversity 7. Waste 8. Air 9. Energy 10. Fuel

3 – IPDM

Banana weevil borer

Activity peaks for banana weevil borer occurs from September to October and from March to April. During the cooler weather, weevil borers are less active and retreat into the plant. Banana weevil borers prefer to feed on decaying material, so they will be at a higher pressure level after weather events causing serious plant damage (storms and cyclones), and in blocks where farm practices have broken stems or damaged corms (e.g. 2-4-D and mechanical desuckering).

Physical control

Completely eradicate all banana material from the fallow crop. As with nematodes, Banana weevil borers can continue to live on small pieces of plant material and small volunteer plants. Stem injection with glyphosate for crop removal is effective as it completely destroys the banana plant. All volunteer banana plants should also be treated to prevent 'hot spots' from developing. **WARNING** – Suckers have been known to translocate glyphosate back into the mother plant so care is needed if hanging bunches remain in the paddock. When the plants have softened sufficiently, from the glyphosate, go over them with the discs to remove material that may be a potential harbouring ground for banana weevil borer. This is critical as decaying material can potentially attract more banana weevil borers. The permit for glyphosate use in the banana industry is available at the Australian Pesticides and Veterinary Medicines Authority website by searching the permit database by permit 11733 or by following this link <http://permits.apvma.gov.au/PER11733.PDF>.

Biological control

General predators. The large range of general predators includes ants and earwigs. However, they are not often in sufficient numbers to provide control on their own.

Cultural control

Fallow period. Leave a sufficient fallow period to allow all plant material from the previous crop to decay before replanting. Best practice would include a fallow crop.

Fallow crop. Incorporating a fallow crop in the crop cycle helps provide ground cover and organic matter, while providing sufficient time to ensure all banana material is broken down. It also eliminates volunteer bananas that could carry banana weevil borer from one crop to the next plant crop.

Clean planting material. This is especially important when cultivating new ground. Tissue cultured plants are guaranteed to be free of banana weevil borer. If using bits or suckers trim the material well, making sure material with any evidence of banana weevil borer damage is not used. Remove any attached soil and treat with chemical if necessary.

Baits. Consider using stem baits or pheromone baits to monitor banana weevil borer populations. Baiting is most effective in autumn and spring when the banana weevil borer are most active. Visit the ChemTica web page for more information <http://www.chemtica.com/site/?p=2764>.

Stem decay. Rapid decay in harvested stool stems is also a sign of banana weevil borer activity. If the harvested stool is

27. At any time the home page, dashboard and resources sections are available at the top right of screen near the “LOGOUT” icon.

Banana Best Management Practices Guidelines

Home Dashboard Resources **LOGOUT**

Resources

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1 – Soil

Soil structure

Soils are classified into a range of soil classes. Bananas grown in better class soils have higher yields and are more profitable. Bananas prefer soils that are not prone to water logging. They should be free-draining, have good internal structure and be suitable for cultivation. It is important to understand the soil types on your farm, their characteristics and the best way to manage them. Select farming practices that will maintain or improve soil structure to ensure optimal productivity.

Crop rotation

Planting a fallow crop in between each banana crop rotation helps to maintain or improve the soil structure. In any fallow period, it is important to kill volunteer bananas as they can harbour pests and diseases from one crop rotation to the next. The longer the block can be left fallow, the better for soil health. Ideally, blocks should be left with a fallow crop for a minimum of 12 months.

A break in production, by introducing a fallow crop, is important for:

- Banana pest control – introducing a crop that is not a host banana for pests such as banana weevil borer or plant-parasitic nematodes, breaks the pest life cycle, effectively removing them from the block.
- Soil biology – introducing a new crop encourages a diversity of microorganisms and maintains an environment that is conducive to growth, as an active root system is required for a healthy food web.
- Organic matter – incorporating fallow crops into the crop rotation helps to improve soil organic matter levels.
- Erosion protection – a fallow crop provides soil cover and protection against the impacts of rainfall and surface water runoff.

Selecting the fallow crop in a banana rotation depends largely on two factors:

- the presence or absence of plant-parasitic nematodes
- the length of time the block will be left fallow

If plant-parasitic nematodes are present, it is important to identify which nematodes cause the main economic problem. There may be more than one type of nematode present, but the nematode likely to have the largest economic impact is the banana root-knot disease. For more information on nematodes, visit the website on banana root-knot disease.

BACK TO MANAGEMENT PLAN

28. There is also a search function that helps to find where a specific topic or issue is mentioned in the resource material

Banana Best Management Practices Guidelines

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Resources

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1 – Soil

Introduction

1.1 – Soil structure

1.2 – Soil erosion

1.3 – Soil acidity and alkalinity

1.4 – Salinity

1.5 – Acid sulphate soils

Soil structure

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General

It is recommended that you re-visit the Banana BMP at least annually. Farming practices will change over time and items on your management plan will be completed. Therefore you should take the time to regularly review the checklist and management plan. Users of the online version will automatically be sent a reminder, 12 months from when they first register, to re-assess their practices.

If you have any questions about the Banana BMP please refer to the **“Online Banana BMP Training Instructions”** available at abgc.org.au or contact Naomi King on 0459 846 053.

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