Sustainable practice development, and the Horticulture industry in NZ

The development of GAP and Good Management Practice

Tasman FLAG presentation – 17 Sept 2014

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ENVIRONMENTAL MANAGEMENT SYSTEM FRAMEWORK

Aspect	Problem ID	Science / Tools	System	Audit / report
Nitrogen	✓	W	W	W
Phosphorous	✓	✓	✓	W
Soil Cons.	✓	✓	✓	W
Water eff.	✓	✓	W	
Agrichems	✓	✓	✓	✓
Biodiversity	W	W		

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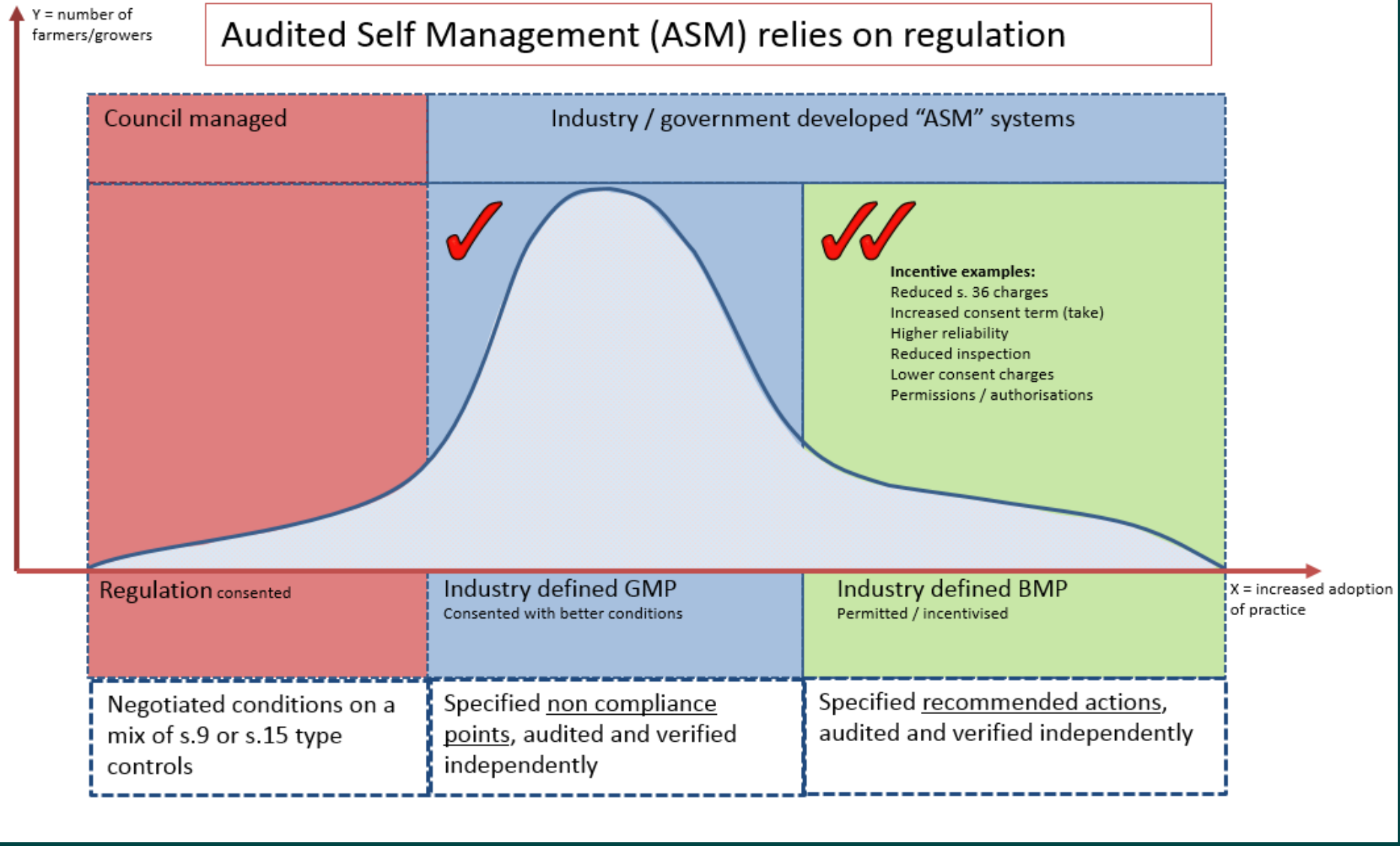
Strategy for horticulture sector

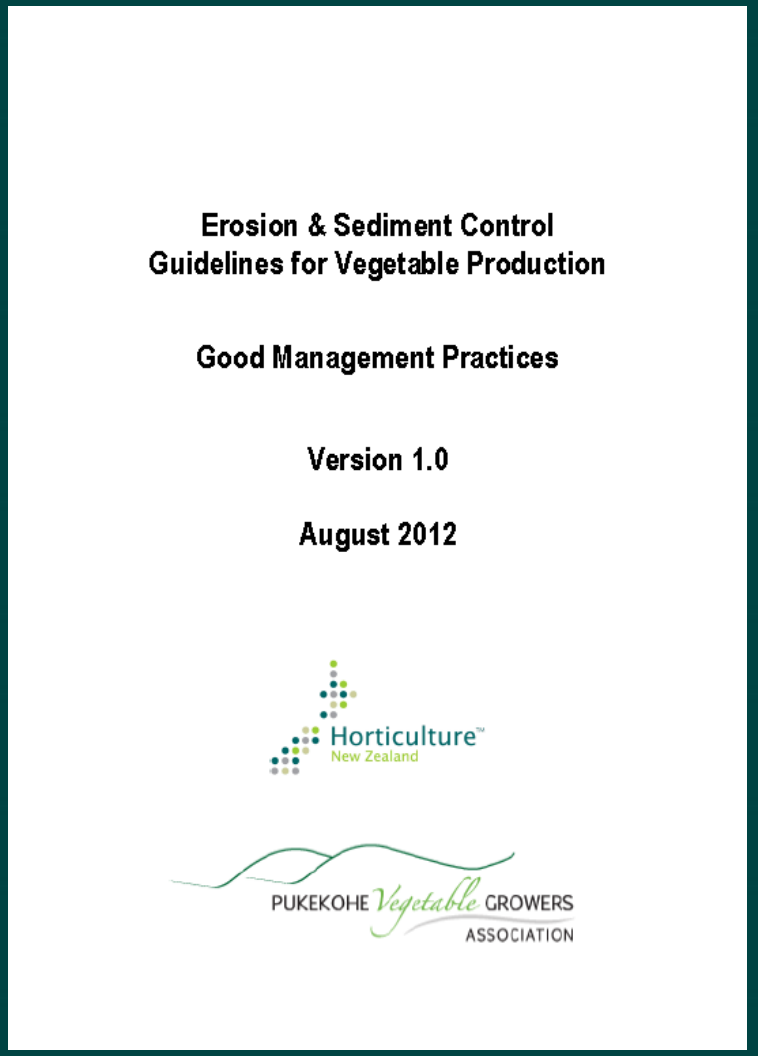


Soil Conservation

- Based on Horizons Region Code of Practice - a revision of Ohakune CoP's and FSP
- 12 Years plus of industry led science now.
- New Approach: Risk based assessment, laying out a pathway to achieve maximum protection.
- Methods are inclusive and all encompassing.
- Out for comments with growers, Councils, EDS, Forest and Bird, Iwi before finalising.
- Growers wish to incorporate nutrient management but may publish NM separately.

Risked based assessment:

"Prioritising the methods with the greatest environmental benefit practical for your farm"



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Soil risk assessment

THE FOUR KEY STEPS TO MINIMISING SOIL EROSION & SEDIMENT LOSS

1. Paddock assessment

Map and describe the paddock (slope, area, history)

Identify where water is coming from

Identify where water leaves the paddock

2. Implement control measures for stopping or controlling water entering the paddock

Interception drains

Correctly sized culverts

Benched headlands

Bunds

Grassed swales
(controlled overland flow through the paddock)

3. Implement erosion control measures to keep soil on the paddock

Cover crops

Wheel track ripping / Wheel track dyking

Contour drains

Using short row lengths

Cultivation practices including minimising passes

Harvest management – timing / all-weather facilities

Post-harvest field management

Wind break crops (wind erosion)

4. Implement sediment control measures to manage the water and suspended solids that move off the paddock

Ensure the accessway is not at the lowest point

Raised accessways / Bunds

Vegetated buffers / Riparian margins / Hedges

Silt fences

Stabilised discharge points and drains

Decanting earth bunds and silt traps

Picture: Field tests of sediment movement on dairy land converted to brassica production in the Horowhenua district

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Costs and Benefits

Mitigation strategy	Range in effectiveness (%)	Cost per hectare	Tractor size	Time
Detailed erosion mgmt plan		$80 - $180		
Cover crop	90-99	$82	120	3.00
Minimum tillage	?	?	?	?
Stubble mulching	?	$66	120	1.00
Wheel track ripping	50-80	$33	120	2.00
Wheel track dyking	50-80	$33	120	2.00
Contour drains	30-70	$75		
Contour cultivation	50-80	Not recommended		
Setback strip by drain	50-80	$105		
Wind break crop				
Benched headlands	50-80	$64	170	1.25
Bund	80-95	$130		
Vegetated buffer strip	50-80	$255		
Silt fence	80-95	$378		
Silt trap	80-95	$750 - $1,300		
Silt trap maintenance		$75	180	5.55

Produced by Landcare Research 2013

Verified by Agricultural Engineer

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Strategic approach for vegetable sector

Benchmark nitrogen management performance by region

- Understand grower performance in nitrogen leaching. Demonstrate the range of predicted leaching results.
- Describe the full range of industry accepted good and best management practices.
- Determine the economic efficiency of resource use ($/kgN applied/ha)
- Publish science describing the nature of the footprint, and activities that influence the size of the footprint.
- Describe the economic impact of reducing fertiliser inputs to address limits that will be set.

Develop codes of practice for soil and phosphorous management by region.

- Work off existing templates developed for Franklin and Horizons regions.
- Develop a design standard for the CoP
- Have the Codes independently peer reviewed

Benchmark irrigation efficiency, water use needs and crop requirements by region.

- Water balance models
- Seasonal irrigation demand
- Daily take amounts (mm)
- Economic efficiency of water use by crop
- Identified gmp's specific to sectors.

Design the audit that proves compliance with GMP/BMP.

- Develop the right modules
- Obtain endorsement by RC's, env ngo's and iwi
- Develop a robust reporting system that can
  - Demonstrate adherence to agreed actions
  - Monitor environmental performance
  - Be available publicly for scrutiny

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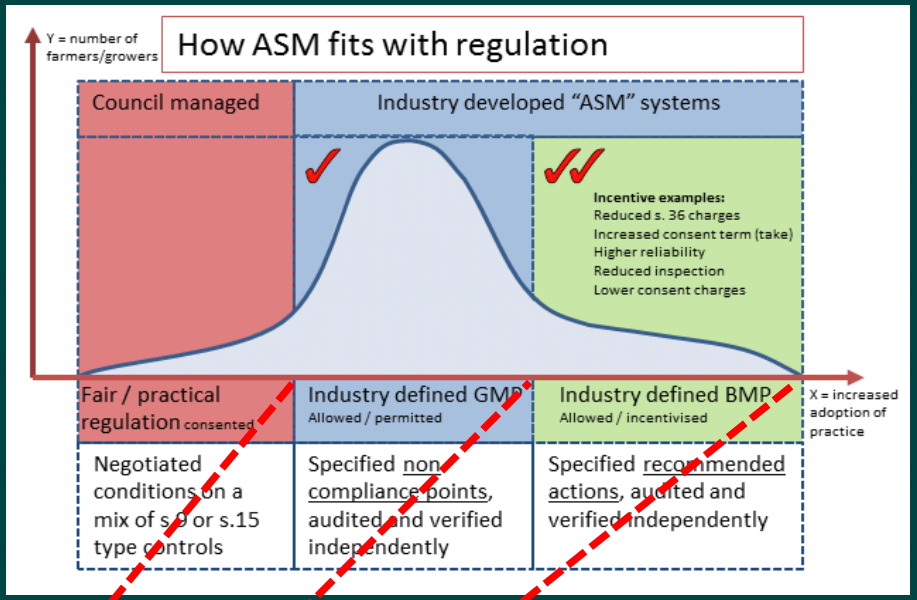
Strategy for vegetable sector (Fruit – less of a priority)

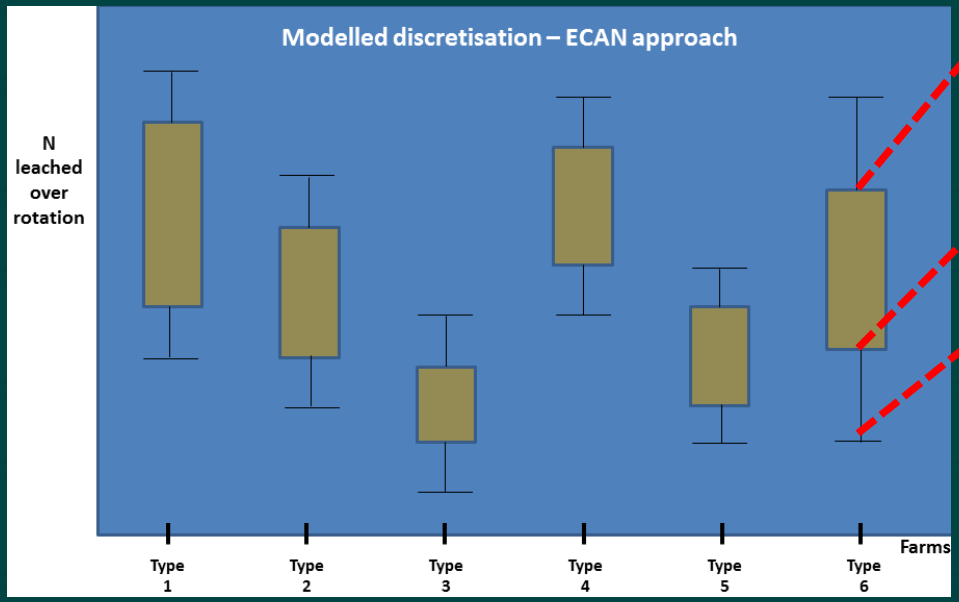
Categorise (discretise) farm type

Benchmark nutrient leaching

Benchmark management techniques

Define N efficiency





Define GMP

Define BMP

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Reality of OVERSEER

NZGAP vegetable cropping programme

Aspect	Problem ID	Science / Tools	System	Audit / report
Nitrogen	x	?	?	
Phosphorous	x	x	X	
Soil Cons.	x	x	X	
Water eff.	x	x		
Agrichems	x	x	x	X
Biodiversity	?			

FRUIT NOT CONSIDERED
NO SCIENCE FUNDING

Aspect	Problem ID	Science and tools	System	Audit / Report
Nitrogen	**Cropping** •Vege crops inefficient uptake of N •Share / lease / rotation is for other reasons not N efficiency •Price and quality driving behaviour •No modern yield / quality / nitrogen trials •Models poorly reflect cropping systems – but N loss likely to be high •Driver for system measuring outputs (Overseer accepted)	**Overseer** •APSIM •FAR Review •Lysimeter network **BMP Devpt** •Grower / Agronomic Reference Groups •Consent process (Horizons) •MGM **Quantification** •Benchmarking •Joint Venture **Investment in other parts of system** •Catchment Modelling	**Code of Practice** •Risk based assessment •Outline of GMP / BMP •International peer review •Grower and Council Review **Certification** •1 day Course •Review Massey •Expert verification of adoption **Consenting** •Conditions •Practice notes	**NZGAP** •Consultation on module development •Data collection / capacity •Reporting systems •Auditor training and cost

Related Science Projects

•Effectiveness of Soil conservation methods (Phosphorous)

•Irrigation efficiency

• Yield response

Nitrogen risk assessment

Risk based approach to nutrient management

1. Understand how nutrient loss occurs and potential risk

Knowledge of movement of nutrients through soil and water

Factors contributing to nutrient loss

2. Information to help decision making

Soil tests

Paddock history

Crop history

Rotation and crop selection

Rainfall

3. Assessing the risk

Using the risk template identify the risk for each contributing factor

Determine the level of risk for the operation

4. Identify and implement GMP's and BMP's to address risks

Pre-planting

Planting and Ground Preparation

Post planting

Harvest and post-harvest

Other BMP's and GMP's

5. Maintaining records

Records should be kept to verify actions taken

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GAP: A strategic response to strangulation from profligate market access systems

www.newzealandgap.co.nz

Plan Proposal for Councils

Key Horticulture issues identified by Council with sectors and iwi

Land and Water Plan

Permitted activity status for NZ GAP certified growers meeting council N and Sediment discharge requirements

NZGAP incorporated by reference in Plan (appropriate modules in appropriate plan provisions)

Default to controlled / consented activity if PA requirements not met or not NZ GAP certified

Nitrogen

Developing Overseer module and GMP definition

Water Use

Adapt generic CoP's

Sediment

Phosphorous

Develop locally relevant COP's

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Land and Water Partnership

Ensuring the primary sector works together to achieve a workable outcome and avoid…….

- duplication of effort
- Unecessary increase in costs of production

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