



Medicinal Plants

Assessment for Taranaki

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Nutraceuticals

1. Dietary supplements

- Contain vitamins, minerals, herbs, amino acids, enzymes
- Forms include gummies, lozenges, drinks, energy bars, powder, pills

2. Functional food

- Includes whole foods & fortified, enriched or enhanced dietary components



The problems

1. Highly-processed food & limited biodiversity increasing rates of non-communicable disease
2. Dominance big food companies mean food choices are dictated often by profit, not health
3. Pace of life limits consumption quality nutrients



Markets

~US\$278.8B 2020, projected to reach US\$441.7B by 2026

Pharmaceutical & nutraceutical markets converging

- Harder & more expensive to create blockbuster pharmaceuticals
- More science underpinning leading nutraceuticals

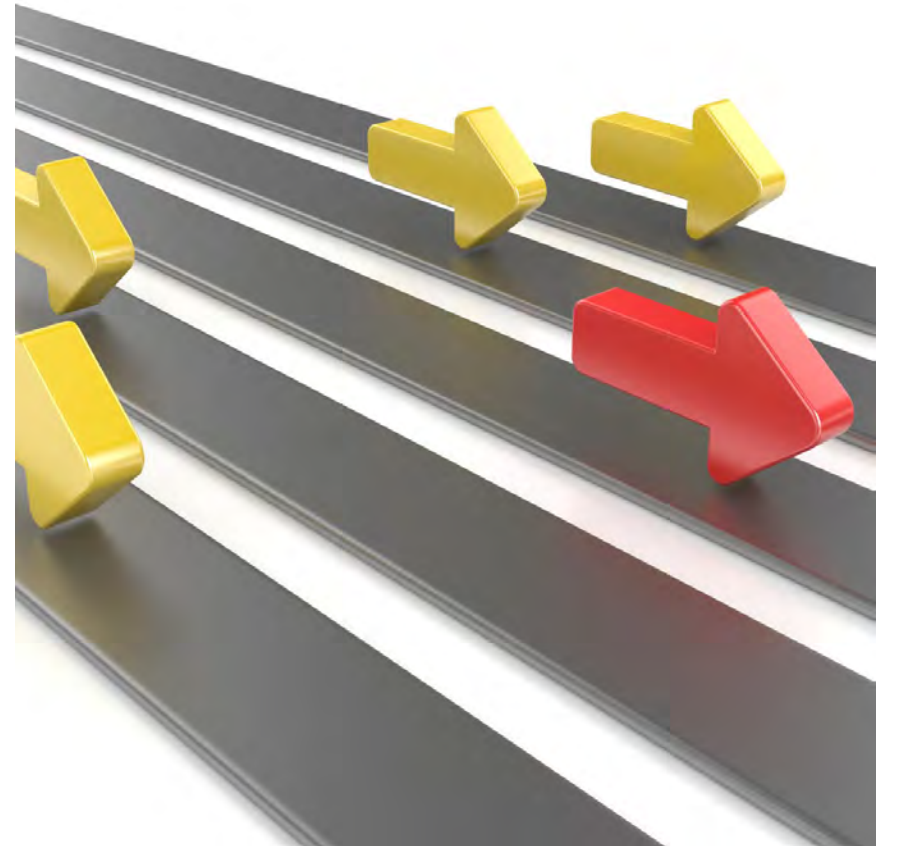
Health trends driving nutraceutical market

- Rise in chronic & non-communicable diseases
- Rising healthcare costs
- Wealth in baby boomer generation
- Demand for natural, plant-based products
- Distrust in pharma



Challenges

- Regulatory compliance barriers
 - New Zealand - can't make claims deemed therapeutic
 - Regulatory environment not uniform across different market
- Fragmented competitive landscape
 - New wave of competition from start-ups & digital business models
- Investment to verify health benefits (difficult to protect)
 - Flip side can piggy back others' research
- Maintenance of product quality & integrity



Purpose

Investigate new plant-based options for land-use in Taranaki from perspectives:

- Agronomic
- Market
- Scientific
- Supply chain



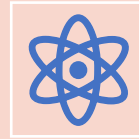
What did we do?



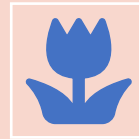
What can grow – long list (from Taranaki growers)



What does market want?



Strength scientific evidence



Selection for further analysis & trials

Analysis spreadsheet

Criteria
Is the product market already there?
Is someone growing it in Taranaki?
How long will it take to reach commercial reality?
Are there existing scientific research and trials, and are they of decent quality?
Are the health benefits sufficient and relevant?
Is the plant suitable for the Taranaki climate?
Potential for NZ (niche market opp?)
Seed availability/ biosecurity concerns
How complex will the propagation/ cultivation methods be?
What are the infrastructure requirements and are they accessible?
Product potential/ value (for Taranaki)?
How much of the plant can be used and what happens to the waste?
Strong
Good
Medium
Fair
Poor



Plant	Decision	Plant type	Potential part of plant and processing considerations
Passiflora incarnata (passionflower)	Strong	Flowering plant, mostly tendril-bearing vines, with some being shrubs or trees.	Flowers, leaves, stems, (fruit), - extraction and drying equipment required
Calendula officinalis (marigold)	Strong	Flowering plant in the daisy family	Leaves and flower petals - Extraction and storage equipment required
Kiwakawa	Strong	Shrub or small tree with erect branches	Fruit, bark, leaves, roots - Drying/heating equipment as well as solvents required
Filipendula ulmaria (meadow/ meadowsweet)	Good	Perennial herbaceous plant	Parts that grow above ground can be used
Marrubium vulgare (White horehound)	Fair	Flowering plant in the mint family	Leaves and young flowering stems
E.g. Nigella sativa (black cumin)	Good	Medicinal herb	Seeds
Sambucus (elderberry)	Good	Flowering plant	Fruit
Melissa officinalis (lemon balm)	Fair	Perennial herbaceous plant in the mint family	Leaves
Scutellaria baicalensis (skullcap)	Fair	Flowering plant in the family Lamiaceae (mint).	Leaves, roots
Rehmannia glutinosa (Chinese herb)	Fair	Rhizomatous, basal-leaved, rosette-forming, herbaceous perennial	Roots
Valerian	Fair	Perennial flowering plant	Roots, rhizomes
Bacopa monnieri herb (brahmi)	Fair	Perennial, creeping herb	Leaves, flowers, vegetable
Centella asiatica (Gotu kola)	Fair	Herbaceous, perennial plant in the flowering plant family	Parts that grow above ground can be used

Long-list from Venture Taranaki (26 plants)

- *Nigella sativa* (black cumin)
- *Echinacea angustifolia* (narrow leafed coneflower)
- *Withania somnifera* (ashwagandha)
- *Leonurus cardiaca* (motherwort)
- *Calendula officinalis* (marigold)
- *Passiflora incarnata* (passionflower)
- *Scutellaria baicalensis* (skullcap)
- *Filipendula ulmaria* (meadowweet)
- *Melissa officinalis* (lemon balm)
- *Bacopa monnieri* herb (brahmi)
- *Sambucus* (elderberry)
- *Artemisia annua* (sweet wormwood)
- *Rehmannia glutinosa* (Chinese herb)
- *Hydrastis canadensis* (golden seal)
- *Ginkgo biloba* (maidenhair)
- *Centella asiatica* (Gotu kola)
- *Astragalus*
- *Hypericum* (St John's Wort)
- Ginger
- *Scutellaria lateriflora* (skullcap)
- Kawakawa
- Usnea
- *Marrubium vulgare* (White horehound)
- *Mahonia aquifolium* (Oregon Grape)
- Valerian
- *Althea officinalis* (Marshmallow)



Process: 26 plants → 10 plants

Can the plant
grow in
Taranaki?

Reliable scientific
evidence &
health benefits?

Existing market
or opportunity to
expand?

Short-list (10 plants)

Nigella sativa (black cumin)

Echinacea angustifolia (narrow leaved coneflower)

Withania somnifera (ashwagandha)

Leonurus cardiaca (motherwort)

Calendula officinalis (marigold)

Passiflora incarnata (passionflower)

Scutellaria baicalensis (skullcap)

Filipendula ulmaria (meadow)

~~Melissa officinalis (lemon balm)~~

~~Bacopa monnieri herb (brahmi)~~

~~Sambucus (elderberry)~~

~~Artemisia annua (sweet wormwood)~~

~~Rehmannia glutinosa (Chinese herb)~~

~~Hydrastis canadensis (golden seal)~~

~~Ginkgo biloba (maidenhair)~~

~~Centella asiatica (Gotu kola)~~

~~Astragalus~~

~~Hypericum (St John's Wort)~~

~~Ginger~~

~~Scutellaria lateriflora (skullcap)~~

Kawakawa

Usnea

Marrubium vulgare (White horehound)

~~Mahonia aquifolium (Oregon Grape)~~

~~Valerian~~

~~Althea officinalis (Marshmallow)~~



Process: 10 plants → 5 plants



Seed
accessibility?

Major
concerns?

Cultivation
requirements &
product value?

Top 5 plants

~~Nigella sativa (black cumin)~~

Echinacea angustifolia (narrow leafed coneflower)

Withania somnifera (ashwagandha)

Leonurus cardiaca (motherwort)

Calendula officinalis (marigold)

~~Passiflora incarnata (passionflower)~~

~~Scutellaria baicalensis (skullcap)~~

~~Filipendula ulmaria (meadow)~~

~~Melissa officinalis (lemon balm)~~

~~Bacopa monnieri herb (brahmi)~~

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Kawakawa

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~~Marrubium vulgare (White horehound)~~

~~Mahonia aquifolium (Oregon Grape)~~

~~Valerian~~

~~Althea officinalis (Marshmallow)~~





Further assessment



Echinacea angustifolia

- Flowering plant native to North America
- Perennial herb, spindle-shaped taproots
- Spring sown
- Blooms late spring to mid-summer
- Pairs well with *Valerian* plants.



Cultivation

- Propagated from seed, crown division & root sections
- 1 kg of seed per hectare
- Seed stratification 4-6 weeks at 1-4°C improve germination
- Moderately rich, well-drained soil, regular irrigation & weed control
- Roots reach desirable state 3-4 years after sowing; 2,500 kg/ha reported by small scale producers



Health

- Reduces inflammation
- Improves immunity
- Lowers blood sugar levels
- High in antioxidants
- Reduces anxiety
- Possible anti-cancer treatment
- Option to prevent & fight infections



Markets



Market

- Global echinacea extract US\$1.5 billion in 2019
- Projected US\$2.9 Billion by 2027
- No. 2 best-selling medicinal herb US (2018)

Prices

- Liquid extract NZD\$25/Kg
- Powdered extract \$35/Kg
- Dried and sifted \$50-\$70/Kg



Next steps

Trials

Business models

Ingredient suppliers

Full supply chain

Private public partnerships



Ngā mihi nui & thank you