

# *Sustainable production of TCM for skincare products*

## ***An Upscaling Farm - R&D on compounds & upscaling***

*The missing link for value creation in high-tech production systems*

Wouter Verkerke PhD, Sarina Veldman PhD & Filip van Noort MSc, WUR, BU Greenhouse Horticulture

Thomas de Waal MSc, Rebel-Nature / contact: [filip.vannoort@wur.nl](mailto:filip.vannoort@wur.nl)



# Goal, Consortium, Intended Results & Workplan

## ■ **Feasibility** of this innovative idea:

- Develop hightech sustainable production of biomass with added value
- Develop new applications of TCM in safe skincare creams in new chains

## ■ **Impact**

- New business models for primary production
- Stop the destruction of Natural Habitats
- New Sino-Dutch cooperation with the best of two cultures

## ■ **Consortium** – Rebel-Nature, Inno Growers, DGD, HAAS, ICRI, WUR

## ■ **Work plan** – Zoom talks, ~~Visit to Henan~~, prepare list of potential crops



# Trends: Natural Ingredients, Sustainable Production

- A worldwide increase in demand of Natural Ingredients
- TCM is a big but traditional market, traditionally aimed at medical doctors
  - Develop high-tech sustainable production of extracts with added value
  - Develop new extraction methods for safe TCM skincare creams
  - Develop new business models in new chains
  - The Greenhouse Pharmacy + Traditional Chinese knowledge of plants



# The applicant: Rebel-Nature : Skincare Products

- Thomas de Waal
- MSc Organic Chemistry
- Start-up, going into Scale-up phase
- Now rapidly expanding
- 100% Natural Ingredients
- Production in Amsterdam Noord
- Several lines of skincare products
- Turnover: 2015: 30 k€; 2020: > 3 M€
- Bottleneck:
  - *The Sourcing of Natural Ingredients*









# Workplan & Results

- Two ACT student teams + Literature research (Dr. Sarina Veldman)
- A shortlist of 13 TCM crops was established:
  - ✓ Potential application of extracts in skincare creams of Rebel-Nature
  - ✓ Potential profitable cultivation in hightech greenhouses
- Zoom, TEAMs and live talks with stakeholders – no travel!
  - ✓ Raise contents of specific compounds (LED light, T, fertilization)
  - ✓ Further develop new extraction techniques (Rebel-Nature)
  - *Develop clean biomass streams in sufficient quantities (Upscaling)*

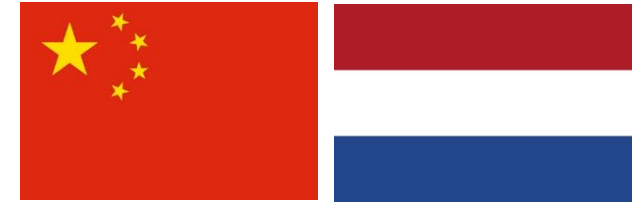


# Bottlenecks Identified: Upscaling & Cooperation

- **These developments are feasible**

- ✓ Sustainable production of safe TCM herbs
- ✓ Elevated levels of plant compounds, safe & pesticide-free
- ✓ New extraction techniques and application in safe TCM creams

- **Missing Link** – Cooperation & Upscaling



- **Solution** – A set of two Sister R&D Upscaling Farms in NL & PRC

- *Cultivate plants, Extract compounds & Apply in TCM creams*
- *New business models: Seeds in, Bottles out*
- *Model for upscaling production world wide*

# Partners HAAS & ICRI (*Zhengzhou, Henan, PRC*)



- Both institutes have a focus on TCM research
  - Extending the current cooperation with WUR
  - New High-Tech Greenhouses for R&D
  - New business models from The Greenhouse Pharmacy
  
- Future Actions
  - Build up friendship relations between Lansingerland & Zhengzhou
  - Intensify relation between WUR, HAAS & ICRI
  - Investigate added value of developing 2 Sister R&D Farms



# R&D Upscaling Farms – Investors & Partners in NL

- **Municipality** – Interested in attracting new type of economic activities
- **Producer of creams** – Secure sourcing of various unique ingredients
- **Grower cooperation** – Upscaling of various new crops
- **WUR** – Research on compounds and upscaling
- **Greenhouse constructors** – Develop Upscaling Farms world wide
- **Partners:**
  - Hogeschool Rotterdam, HAAS, ICRI, Municipality of Zhengzhou
- **TKI instruments and other options**
  - Demonstration, valorization & field labs
  - PPP research on compounds with added value & upscaling

# Concept lay-out of a R&D Upscaling Farm

- 1 x 1000 m<sup>2</sup> , 3 x 500 m<sup>2</sup>, 6 x 50 m<sup>2</sup> (options: fertilization and LEDs)
- Open cultivation space + 2 cabriolet greenhouses, 140 m<sup>2</sup> each
- Industrial space for drying, CO<sub>2</sub> extraction, packaging & marketing

- **Investors**

- Public-private + crowd funding

- **Joint Venture**

- Exploitation by WUR, BU Greenhouse Horticulture

