Integrating “The orchard of the future” into the research agenda

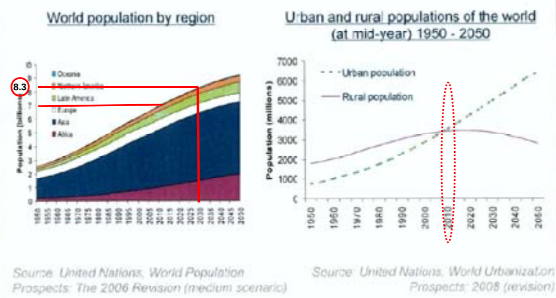

**…today**

- macro trends
  …. impact of these trends on the future orchard
- targets
  …. hurdles to achieve targets
  …. So what are we doing about it?

“The orchard of the future”

**What are the trends that will have an impact on profitability of the orchard of the future?**

**Increase in global population and urbanisation**

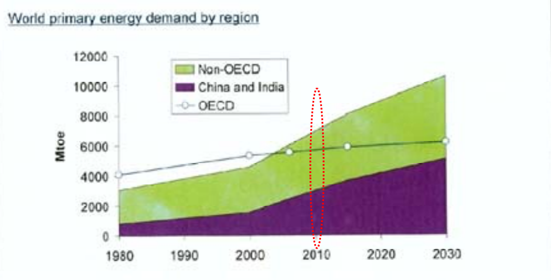



**Poverty alleviation**


**Areas of increased global water scarcity and stress**


Total world water demands are predicted to increase by **over 30% by 2030** Source: IFPRI

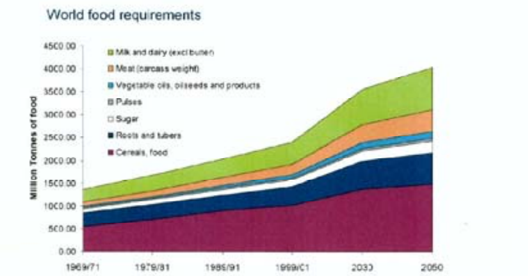
## Increased demand for energy




Total world energy demands are predicted to increase by approx. **50% by 2030**

Source: IEA 2008. Reference Scenario

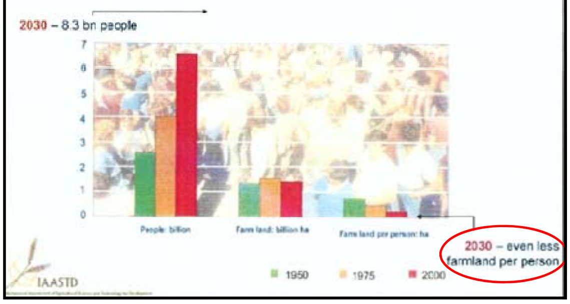
## Increased demand for food




World food production must rise by **50% by 2030** to meet increasing demand (Source: UN 2008)

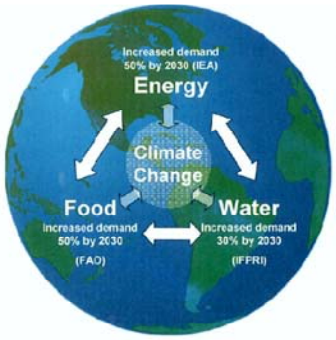
## Agricultural production
## More food and less land

More people means less cultivated land per person for food, feed, (agro)-fuel and fibre production




## The perfect storm?

1. Increasing population
2. Increasing levels of urbanisation
3. The rightful goal to alleviate poverty
4. Climate Change




Source: J Beddington –UK Government office for Science

## . . . trends

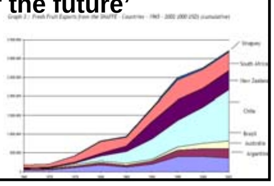
TESCO

### Markets

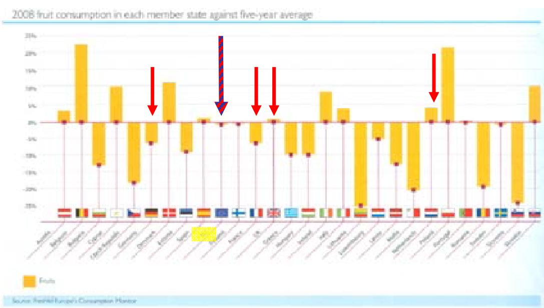
– Commodity
– Power of supermarkets
– However, SHIFT greater focus on "SUSTAINABILITY"

### Impact on 'Orchard of the future'

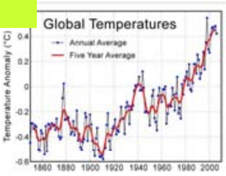
– ↑pressure on orchard profitability
– Need for growth
  • sustainable



## Fresh fruit consumption



## . . . trends



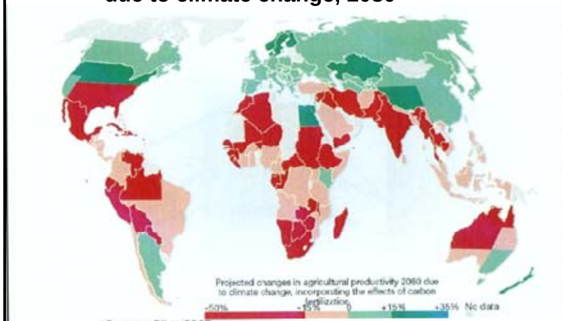

### Climate change

- Warmer
- Dryer in West of SA
- Wetter / more sporadic in East

### Impact on 'Orchard of the future'

- Less irrigation water
- Less winter chill
- Pest management

## Changes in agricultural production due to climate change, 2080



Source: Cline 2007, http://maps.grid.no.go/graphic/projected-agriculture-in-2080-due-to-climate-change

## Catalyzing a fundamental shift in the way we manage our business

www.climatefruitandwine.co.za

CONFRONTING CLIMATE CHANGE
A SOUTH AFRICAN FRUIT & WINE INITIATIVE

ACT NOW!


## . . . trends

### environmental

- Sustainable ecosystems
  - Water
  - Energy
  - Biodiversity
  - Nitrogen
  - Soil
  - Re-use and recycling

### Impact on 'Orchard of the future'

- ↓irrigation water
- ↓energy inputs
- ↓nitrogen input
- ↑soil health
- different choice of products

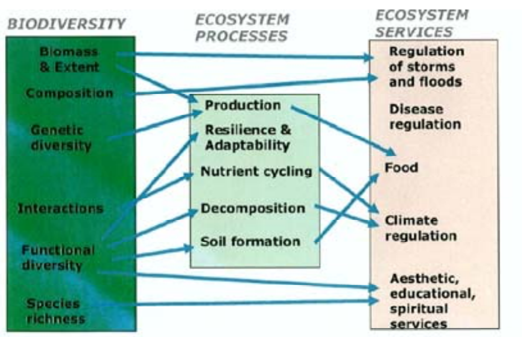
Financial

Environmental

sustainability

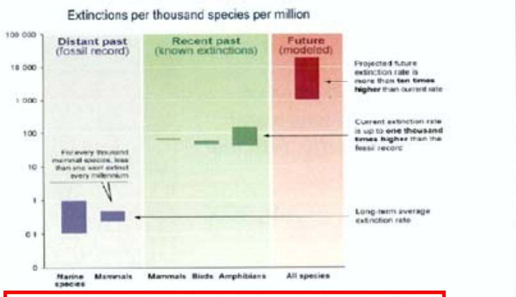
Social

## Why does biodiversity matter?




Source: Millennium Ecosystem Assessment

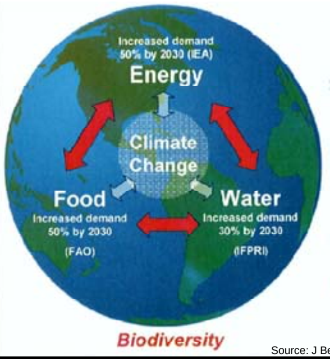
### Extinction of species




Future extinction rates estimated to be 10 to 100 times higher

Source: Millennium Ecosystem Assessment 2005

### 5 Key Questions




1. Can 9 billion people be fed equitably, healthily and sustainably?
2. Can we cope with the future demands on water?
3. Can we provide enough energy to supply the growing population coming out of poverty?
4. Can we mitigate and adapt to climate change?
5. *Can we do all this in the context of redressing the decline in biodiversity?*

Source: J Beddington –UK Government office for Science

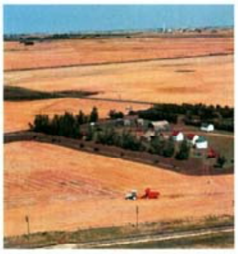
### The challenge

**Need:**

50% more production on less ***land***, with less ***water***, using less ***energy***, ***fertiliser*** and ***pesticide*** …

…by 2030

… whilst not increasing ***GHG emissions***



Source: J Beddington –UK Government office for Science

0.2 litres

=

**240 litres Water**

## . . . trends

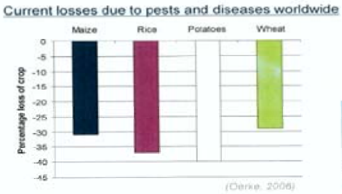
## Food safety

- –↓ chemical inputs
- – microbial contamination
  - Contaminated irrigation water

### Impact on 'Orchard of the future'

- – seek non-chemical control
- – seek pest & disease resistant cultivars

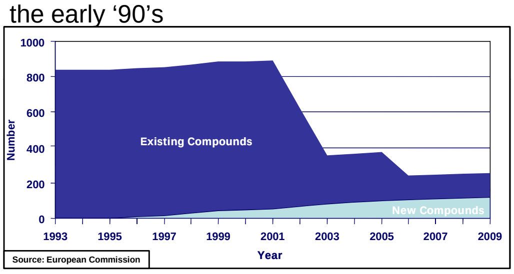
## Food security - Crop protection



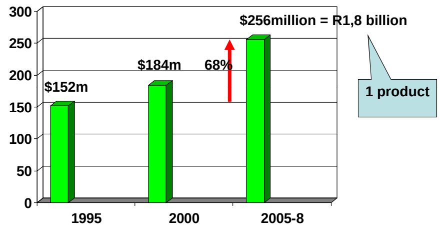

Total worldwide crop losses are estimated to be in excess of **40%** (Yudelman et al 1998)

## What impact...?

- Many active substances already lost since the early '90's



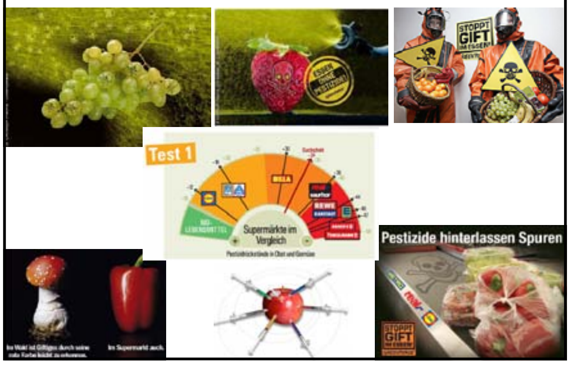

## R&D + registration costs of a new Plant Protection Product




| Products / year | 4 | 2 | 1.3 |
|---|---|---|---|

Source:

## NGO – Greenpeace Campaign !!





## ….Media/ Campaigns…

**Boys grew breasts 'after crop spraying'**

Probe into pesticides after spate of physical abnormalities hits farming community in Limpopo

## . . . trends

**labour**

- ↓ availability
- ↑ cost
- ↑ worker safety / ethical

**Impact on 'Orchard of the future'**

- > worker friendly
- ↓ labour inputs

"The orchard of the future?"


## 1. Cultivars

- **High Value**
- **Pest/Disease resistant**
- **Adapted to climate change**

## 2. Production

- **35 tons or more/ha (fresh)**
- **Fruit size count 20 - 70**
- **Good sugars, taste and drying ratio**

## 3. Orchard design

- **Planting density – Trees/ha**
- **Efficient rootstocks**
- **Labour efficiency – pruning, thinning, harvesting**
- **High water use efficiency**

## 4. Drying & processing

- **Costs??**

## 5. Marketing & Promotion

- **Use the benefits of Prunes in Marketing and Promotion – Health!!!**

## Limitations

- **Competes for resources**
- **Small commodity**
- **No cross subsidisation $**