

An aerial photograph showing a vast agricultural landscape. The terrain is a mix of brown and tan, indicating arid or semi-arid conditions. A prominent feature is a large area of circular fields, likely created through center pivot irrigation. These fields are arranged in concentric circles around a central point, with colors ranging from dark green to light tan, suggesting different stages of crop growth or different crop types. A network of dark lines, possibly roads or irrigation canals, crisscrosses the landscape. In the bottom right corner, there is a blue rectangular outline on the ground.

Farming with Biodiversity

Steven Squires



Who are Farmers?

- Utilise land to grow crops and stock
- Commercial farmers
 - Make a living out of this
 - High-risk
- Buffeted by weather, government, markets
- Competition is fierce
- Sentimentality is a luxury



Types of Farmers

- **Good farmers & profitable farmers**
- No good non-profitable farmers
- Are profitable, good farmers
- In my business, we aim to be profitable
- Goodness comes second



Like It or Not

- Farmers are the de facto custodians of what exists on their land
- *If it pays, it stays*
- If it doesn't → makes way for something that does
- **Resulted in spectacular loss of wildlife and habitat where no commercial value is attached**



Ecology & Agronomy 101



WILDLIFE REQUIREMENTS

- Food
- Cover
- Water
- Diversity of vegetation
- Safe Breeding areas

AGRICULTURAL REQUIREMENTS

- Clear spaces
- Uniform vegetation
- No standing water
- No fire hazards
- No weeds
- No trees



Resolve These Contradictions

- Embrace technology → makes farming more profitable
- Embrace technology that is less destructive
- Accept ecosystems are dynamic, nature will adapt
- Accept some alien vegetation, it creates diversity
- If necessary, pay for “set aside”
- Biodiversity for the bottom line

Practical farming & biodiversity: Harnessing Technology



HOTSPOTS

- **At the margins:**
 - ✓ Crops-headlands
 - ✓ Forest-meadow
 - ✓ Swamp-dyke
 - ✓ Veld-waterhole
 - ✓ Road-verge
 - ✓ More margins more diversity
- ✗ Large scale monoculture
- ✗ Long straight fields

DO

- ✓ Make smaller fields
- ✓ Use technology – GPS guided tractors
- ✓ Identity unproductive areas – leave fallow
- ✓ Plant genetically modified (GM) crops – less herbicides & pesticides
- ✓ Leave crop residue & stubble
- ✓ Spill at water troughs
- ✓ Leave rock piles
- ✓ Have corridors of ungrazed/unburnt veld
- ✓ EDUCATE farmers & staff

Karoo Plains with Eucalyptus Riverine Forest



Marshland with Dyke and Tree

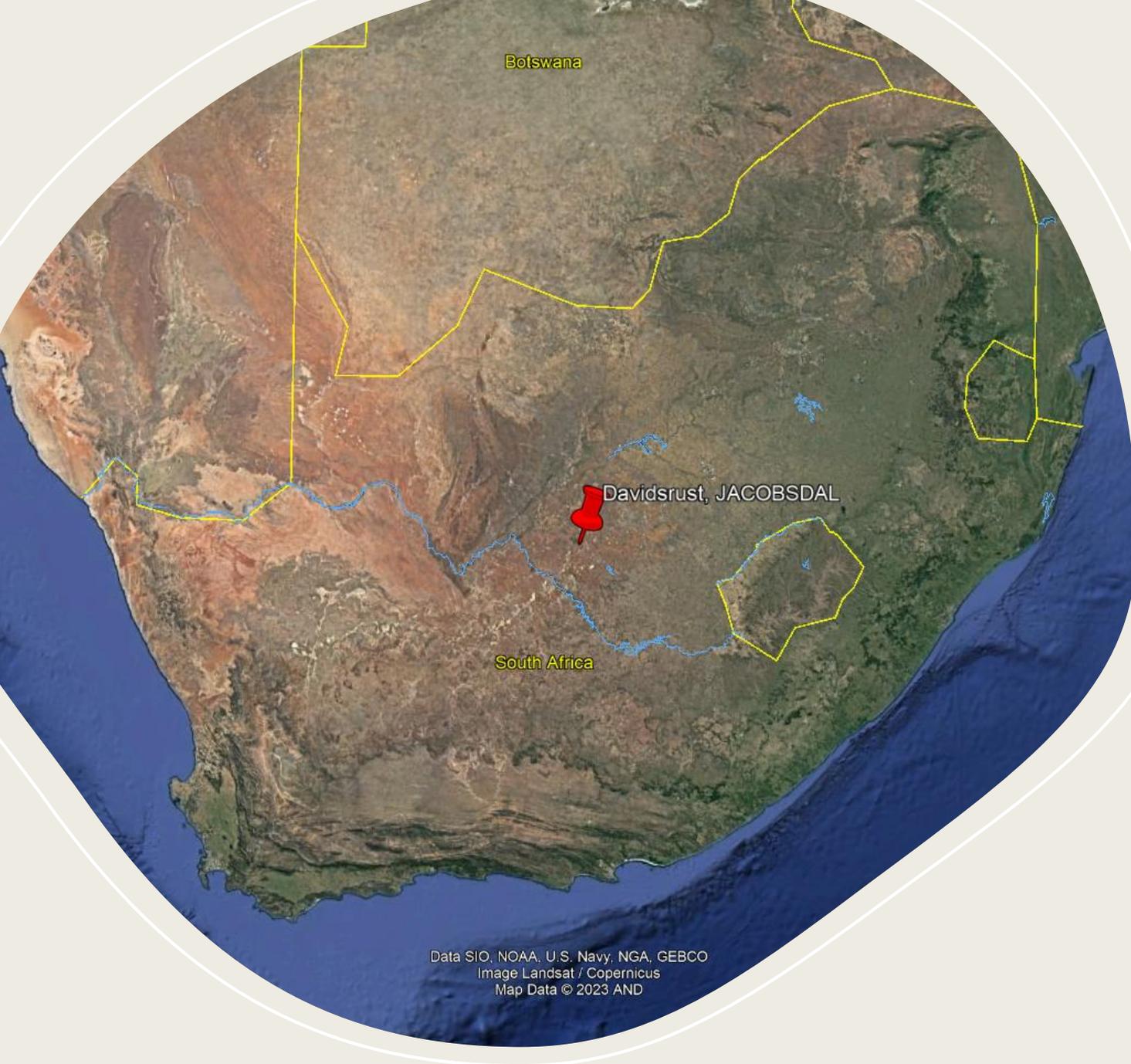


Kalahari Thorn Veld with Dead Tree





Thick Cover Adjacent to GM Maize
No Headland Required



A Feel good story

From central South Africa

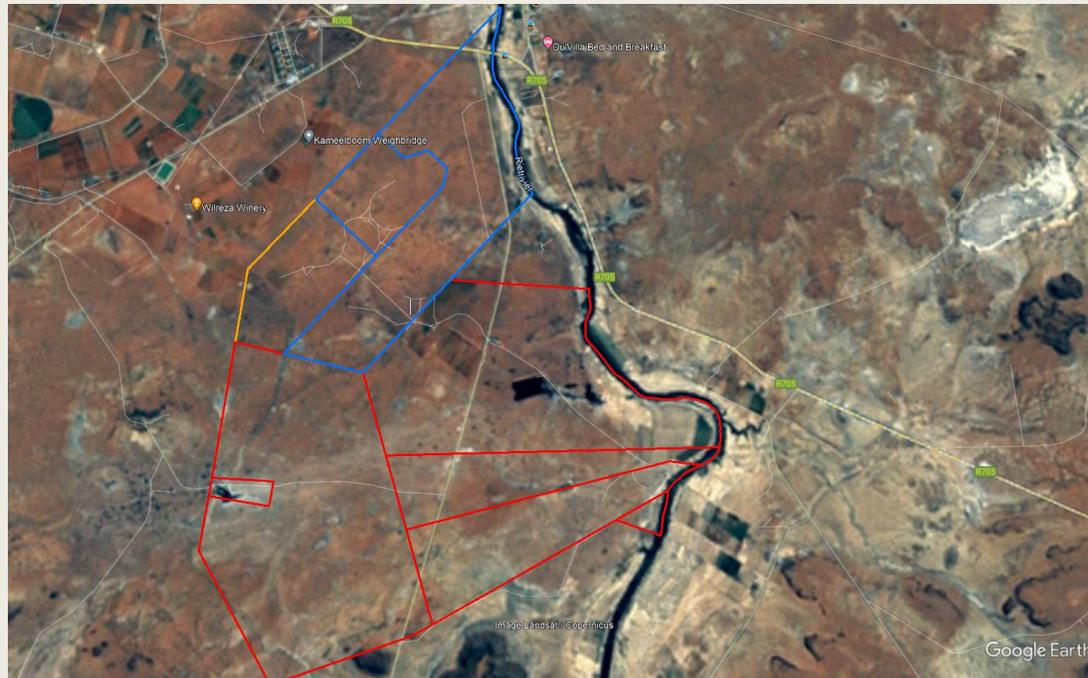
31 years ago

an overgrazed wasteland of red sand and thorn scrub in central SA:

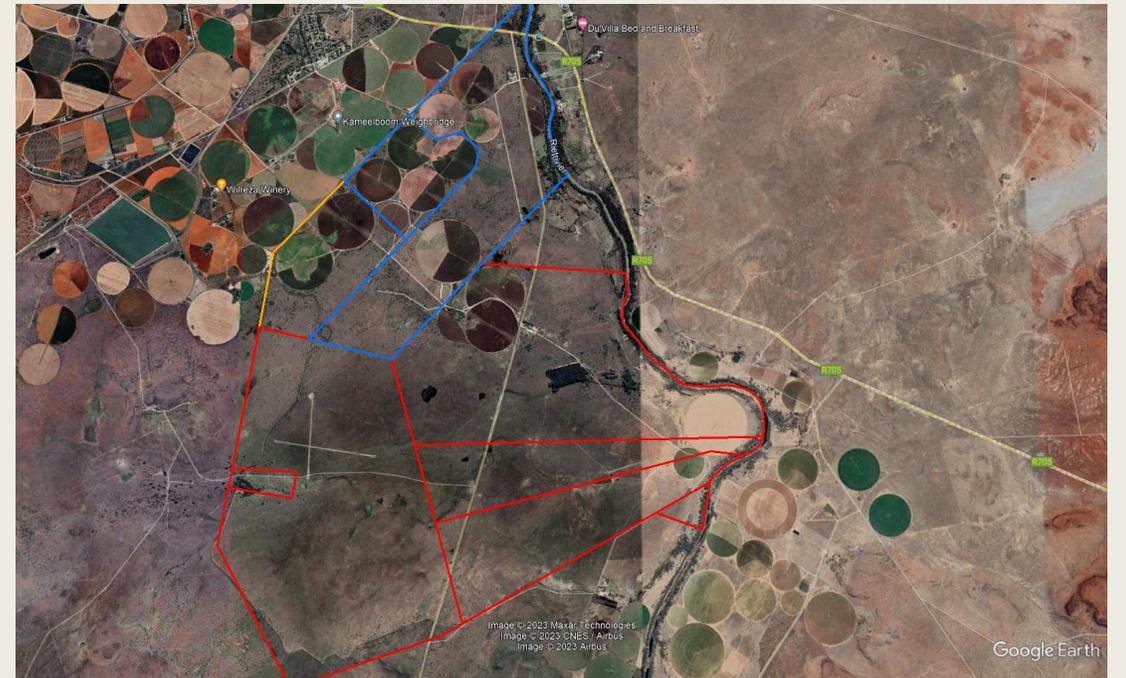
- Kalahari to the north
- Karoo - south
- Namaqualand - west
- Highveld grasslands - east

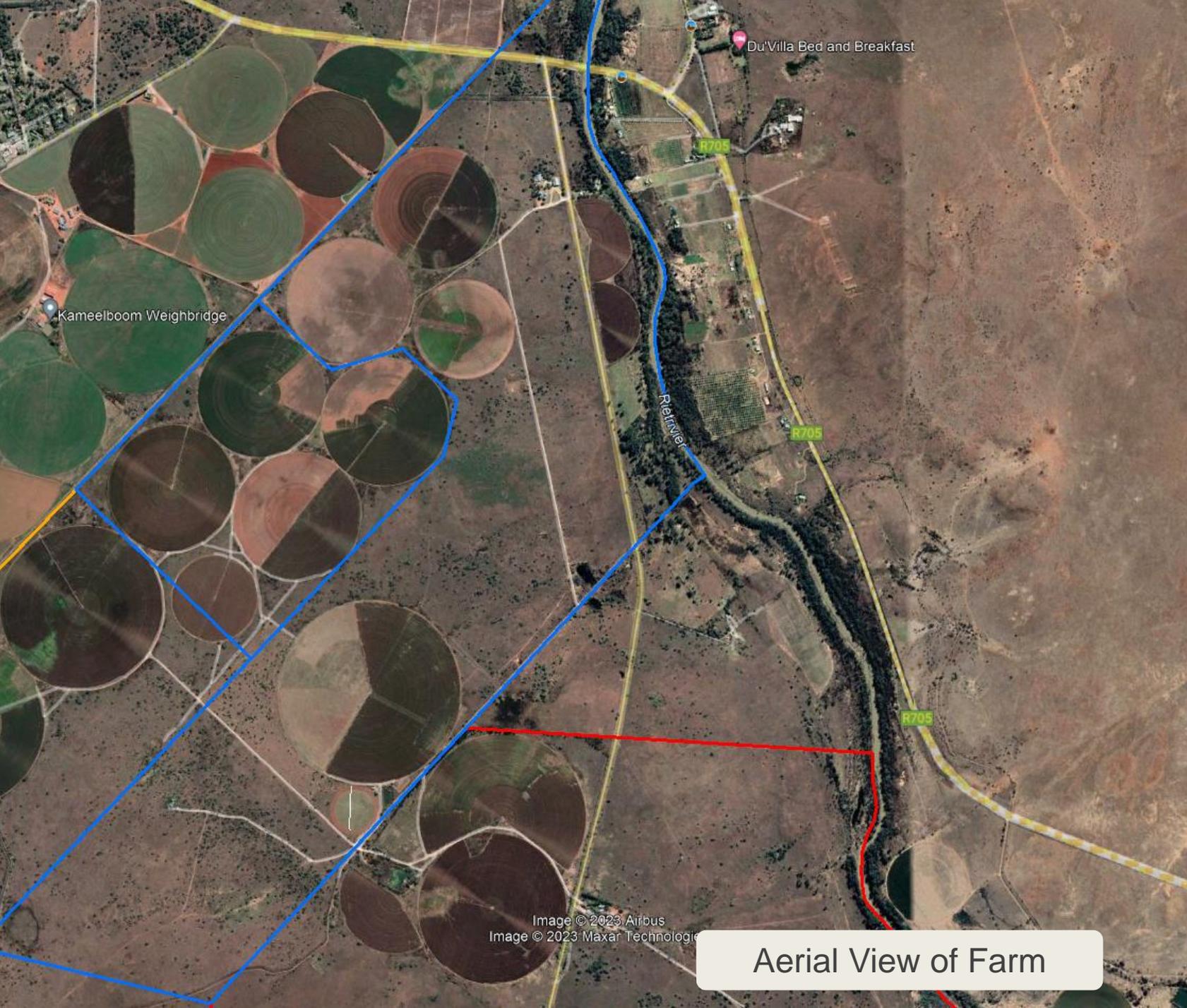
“Rooibult”

1985



2023





Aerial View of Farm

Development

- Purchased water rights
- Centre pivot irrigation 30Ha (616m diameter)
- Borrowed money
- Left spaces between pivots veld



Development

- Grew wheat, beans, peanuts, maize, cotton
- Sprayed organochlorines, carbamates, pyrethroids, triaziens, chloroacetanilides and many others
- Survival and profitability were paramount
- Pesticides killed birdlife
- Joined the dots....Switched to GM

GM – No till – Small field model

1992 & AFTER

- Stock thieves – stop sheep farming
- No need to control jackal/caracal
- They control springhares/mongoose
- BUT gamebird populations remained low – starvation

ADOPTED GM

- ✓ GAME CHANGER
- ✓ Borer and Glyphosate tolerant
- ✓ Pesticide bill plummeted
- ✓ Enabled No Till Cultivation
- ✓ Insects and birds boomed

❖ Result:

- Stubble, beetles and insects
- Decreasing nest predators
- Increasing gamebirds



Nine Species of Diurnal Raptors Nesting

Three owl species





Ten Species of Mustelid



Bat-Eared Fox



Cape Fox



Black-Backed Jackal

Five Felids



Serval



Black-Footed Cat



African Wildcat



Caracal



Leopard

Management

- Control fire
- Veld islands & corridors
- ✓ Ensures nesting habitat
- ✓ Refuge for insects, rodent specialist predators
- ✓ Havens for burrowing & nesting
- Control dogs



Embrace human impact

Infrastructure



Embrace human impact

Alien vegetation



Embrace Human Impact

- Dead trees
- Small shallow sloped irrigation dams



Farming with Biodiversity

Summary



DEVELOP

- Irrigation
- Small fields with uncultivated interfield spaces
- Corridors of natural vegetation
- Small sloping dams

CONTROL

- Domestic dogs
- Fire
- Predator persecution

PRACTICE

- GM cropping
- Conservation tillage
- Tolerance of alien trees
- Tolerance of infrastructure

The farm is in better shape now than then

- Feeds 100 000 persons per year
- Supports 10 families
- Hosts copious wildlife
- Continues to improve

