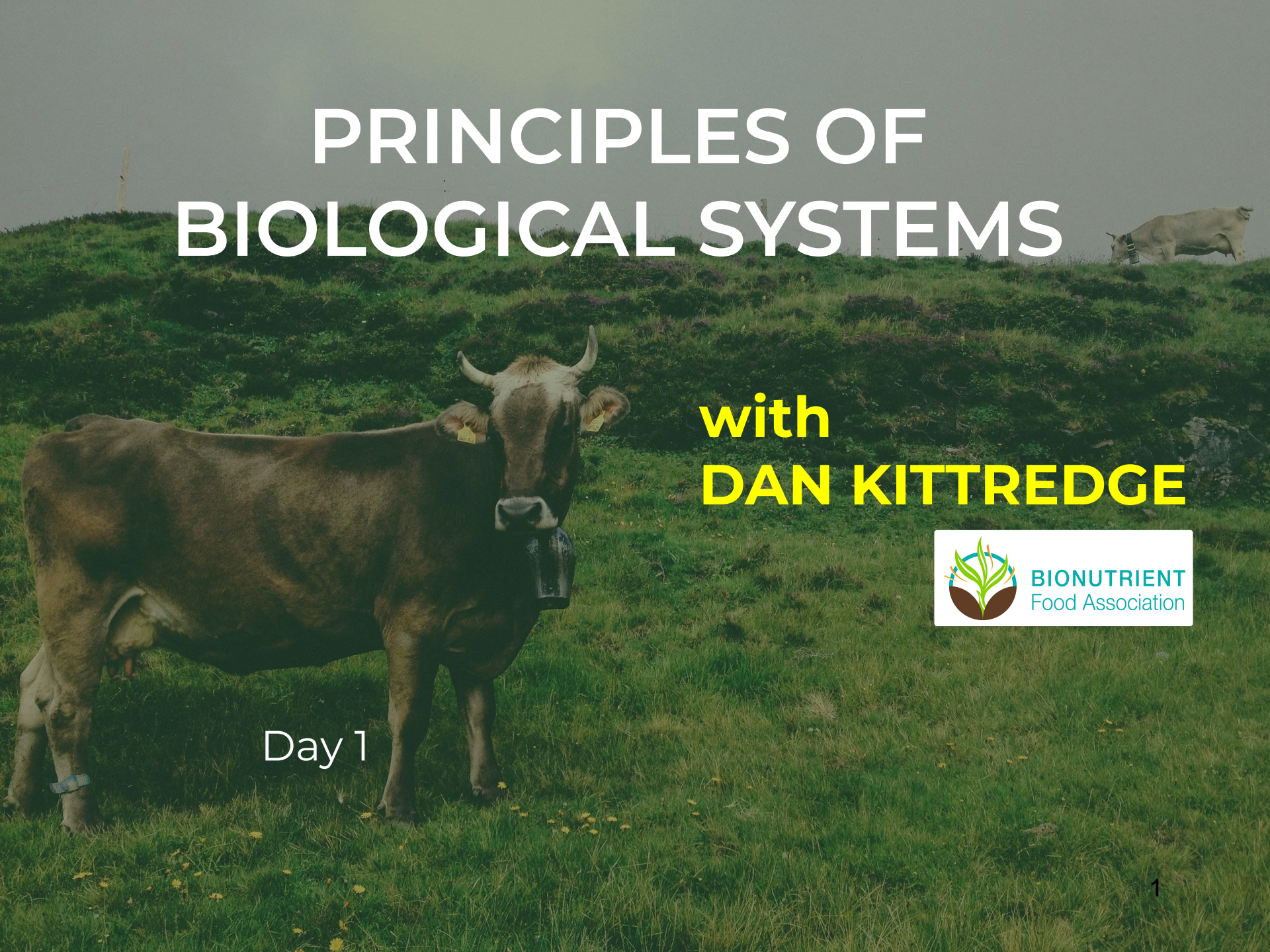

PRINCIPLES OF BIOLOGICAL SYSTEMS

with
DAN KITTREDGE

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Day 1

ADDRESSING LIMITING FACTORS

General principle and objective -- Life will do the best with what she has.

Identify limiting factors and endeavor to address them: Minerals, biology, carbon, water, air.

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LIFE IS THE OBJECTIVE

- Supporting and empowering soil life is the key to healthy plants.
- Things that you do or let be done that harm soil life harm your plants.

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QUALITY OBJECTIVE

- Nutrient Level
- Flavor/Aroma
- Shelf Life

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CORRELATIONS OF HEALTH

- Soil Health
- Plant Health
- Human Health
- Cultural / Environmental Health

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TARGET LEVELS OF MACRO MINERALS

- Base Plus or “Agri-Dyn II” Test
- A Strong Acid test
- Sulfur - 75 ppm
- Phosphorus - 75 ppm
- Calcium - 60-75%
- Magnesium - 12-18%
- Potassium - 3-5%

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TARGET LEVELS OF TRACE ELEMENTS

- Boron - 3 ppm
- Manganese 80-90 ppm
- Copper - 4 ppm
- Zinc - 8 ppm
- Cobalt - 2 ppm
- Molybdenum - 1 ppm
- Selenium - .5 ppm

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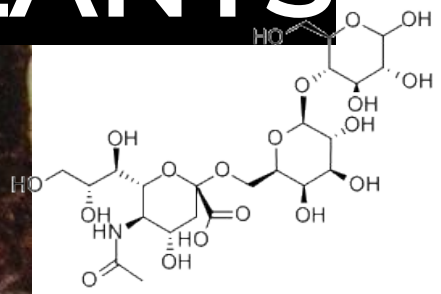
BIONUTRIENT FOOD ASSOCIATION

"Increasing Quality in the Food Supply"

- Membership based, multiple constituencies
- Education - Courses
- Outreach - Handbook, Website, Articles
- Research - Bionutrient Meter, Farm OS
- Real Food Campaign

INOCULANTS



- Collostrum
- Critical symbiotes for plants. Foundational life in the food chain
- Bacterial and Fungal species
- Ideally present at germination

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Seed

- Seed size
- Seed history
- Seedling vigor - culling
- Yield potential – spacing
- SRI/SCI

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POTTING SOIL

- Besides Compost, peat, vermiculite and perlite, Consider, Kelp, Alfalfa, Zeolite, Humate, Montmorillonite, Lime, Rock Phosphate, Gypsum, Trace Elements, and critical role of biological inoculants and enzyme stimulants.

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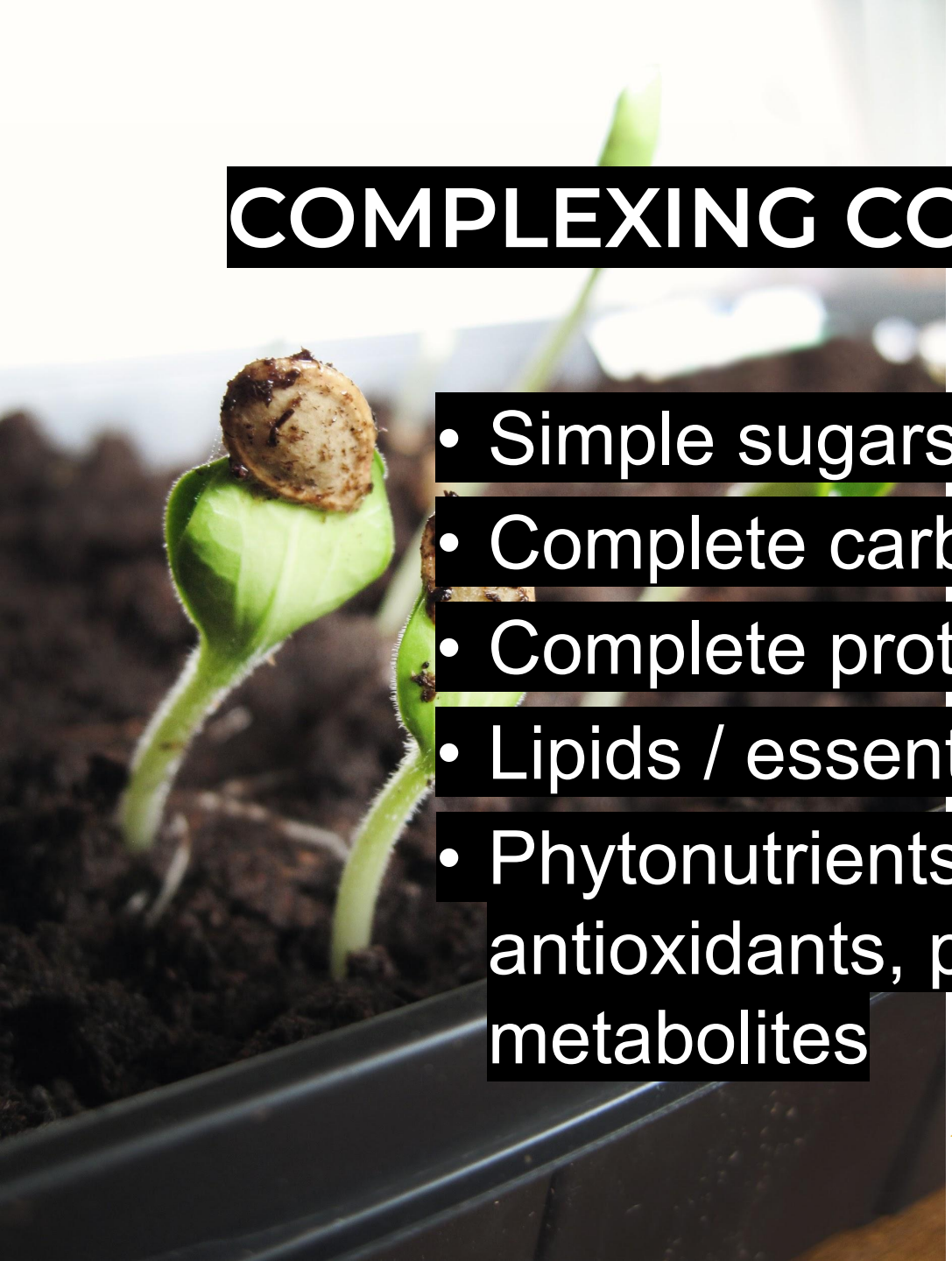
TILLAGE

- Effect of tillage on soil life
- Strategy for minimal tillage
- Permanent raised beds - green or brown mulch



COMPLEXING COMPOUNDS

- Simple sugars
- Complete carbohydrates
- Complete proteins
- Lipids / essential oils
- Phytonutrients, phytoalexins, antioxidants, plant secondary metabolites

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EVOLUTION OF PEST AND DISEASE RESISTANCE

- Complete carbs - soil borne pathogens Fusarium, verticillium, alternaria
- Complete proteins - larval forms of insects cabbage looper, tomato hornworm, corn earworm, colorado potato beetle larvae
- Complete lipids - air borne pathogens mildews and blights
- Complete Phytoalexins - Cucumber beetle, potato beetle, flea beetle, japanese beetle

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Fertigation Irrigation

- Drip tape, sprinkler, hose
- Maintain water at good level in soil at all times. Critical.
- “Good Level” able to pick up soil, clench it into ball and have it stay as a ball.
- Plan to have this system in place
- Fertigation capacity to feed in season

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Foliar Spray

- Plant feeding through the leaf surface.
- Backpack sprayer, squirt bottle, etc.
- Best response when an immediate turn around is desired.
- Very powerful if all other pieces are working.
- Plan to be able to do this now.

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Homework

- Build permanent beds
- Mulch, apply minerals and cover crops
- Procure inoculants
- Good seed
- Potting soil
- Fertigation and Foliar infrastructure
- Read, read, read

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