Biodynamic Compost

More is Less

- One of the few exceptions to the BioDynamic principle!!

In This Session

- Correct Way of Making Good Biodynamic Compost

Introduction

- Our farms need huge amounts of good Compost
- Attaining self sufficiency in Compost should be an important goal on every farm
- If we do not do it correctly we will end up wasting the organic material
  - From 30 tons of starting material we will get only 3 tons of humus instead of 10 tons
- Good compost will smell sweet. It generates proper humus and does not have pathogens

Composting In Nature

- In a forest eco-system
  - The leaves, twigs fall to the ground
  - Deer & other herbivores graze & add their manure to the litter
  - The birds in the trees garnish the organic litter with a spread of their Calcium rich droppings
  - The layers keep building up and are gradually processed by the myriad soil organisms to a balanced nutritive substance for the trees
  - This self sustaining cycle of growth & decay repeats year after year

Common Mistakes

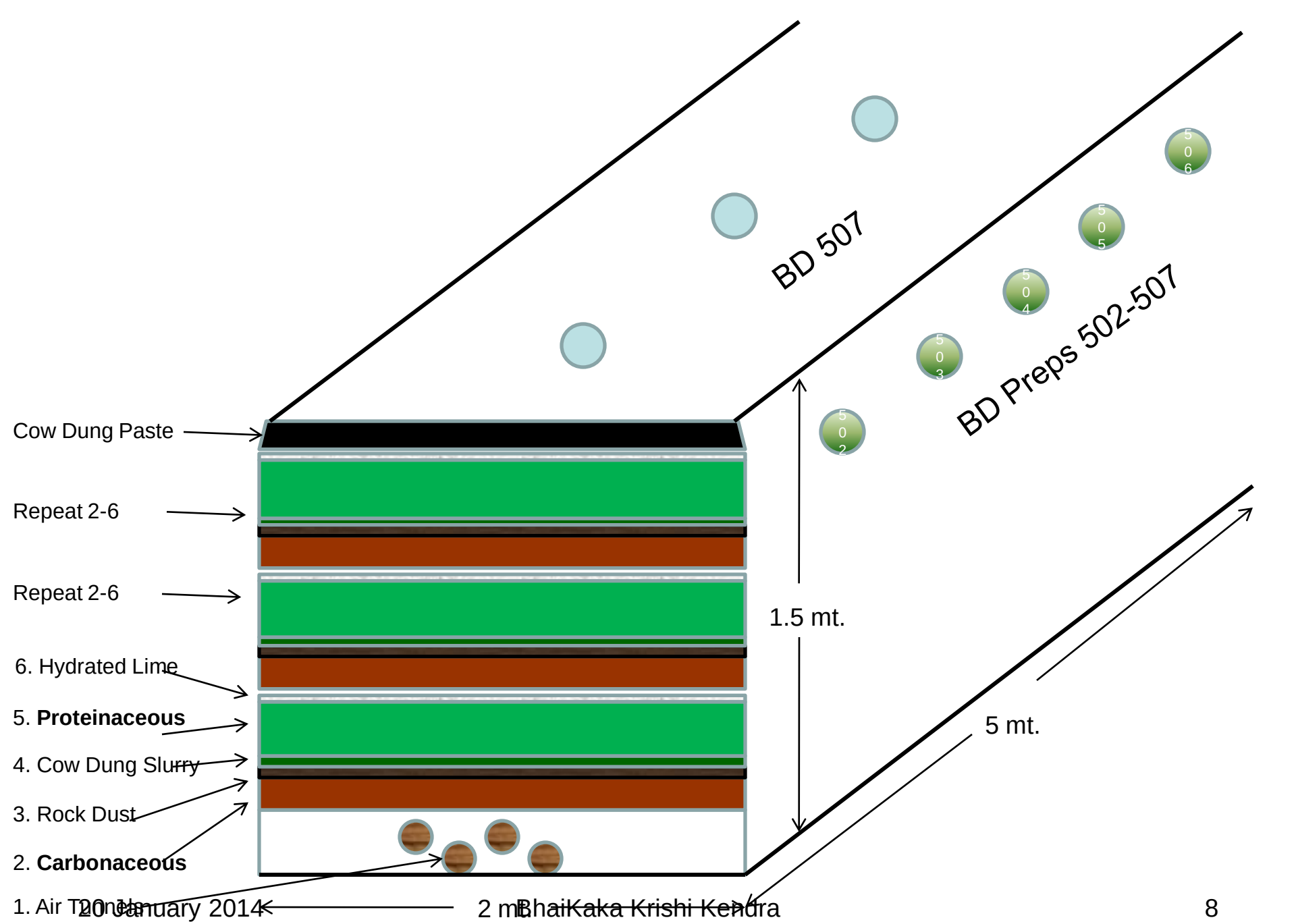
- Making it in a pit
  - Improper water drainage
  - Insufficient aeration
  - Results in anaerobic, bad smelling compost
  - Results in pathogen build up
  - Leads to rotting instead of decomposition
  - Possible exception - only in a very dry/hot place to conserve moisture or in a cold place to conserve heat
- Not having correct proportion and mix of starting material
  - Inefficient decomposition – results in very poor quality
- Heap too small
  - Does not have the critical mass to start the composting process
- Heap too wide or too tall
  - Results in compaction and hence insufficient aeration
- Large surface area exposed to direct sunlight
  - Soil organisms get killed
  - Nitrogen volatization & nutrient loss

Starting Materials

- 60% (by volume) Proteinaceous
  - Green grass, leaves of nitrogen fixing plants (Gliricidia, Sunhemp, Sespania)
- Good quality Cow dung
  - Most of it in the form of a slurry
- 40% (by volume) Carbonaceous
  - Dry grass, dry leaves, paddy straw, sugarcane bagasse, coir pith
  - These materials contain cellulose & lignin
  - Soak in water before adding
- Hydrated lime (type used for applying to walls)
- Woodash (for Potash deficiency) , Rockdust (borewell, quarry dust) , Rock Phosphate
- BD502-507 or CPP (slurry form)
- Air, Water

Ideal Dimensions & Location

- Dimensions
  - 2 meters wide
  - 1.5 meters high
  - 5 meters length
    - No limit on length ; make it as long as practical
  - 1 meter length gives approx. 0.5 to 1 tonne of end product
- Location
  - Must be constructed on good fertile soil so that it can attract an intricate community of micro & macro organisms
  - Away from the trunk of a tree
    - Heat will damage & kill the tree


BD 507
BD Preps 502-507
502
503
504
505
506
Cow Dung Paste
Repeat 2-6
Repeat 2-6
6. Hydrated Lime
5. **Proteinaceous**
4. Cow Dung Slurry
3. Rock Dust
2. **Carbonaceous**
1. Air Tonne
1.5 mt.
5 mt.
2 mt.

Procedure

- Start by marking the area and making air tunnels using twigs and sticks
- Put a 4” layer of soaked carbonaceous material
- Sprinkle wood ash/rock dust/basalt powder
- Put Cow dung slurry over this
- Put 6” layer of green material
- Sprinkle a little lime powder
  - should not come in contact with cow dung (causes nitrogen volatization)
- Repeat & build the layers to a height of 1.5 meters
  - Each layer grouping unit will be about 12”

Procedure (Contd.)

- Make 5 deep and evenly spaced holes on the side of the compost pile
- Using cow dung, make 5 balls. To each ball add one BD prep (502-506). Put each ball in one hole
- Make 3 evenly spaced holes on the top of the compost pile
- Mix 10 ml BD507 in 1 litre of pure water. Stir for 10 minutes. Pour ½ of this in this hole. Sprinkle the rest all over the compost pile
- Make a thick slurry of cow dung and plaster the compost. Cover the pile with straw and coconut fronds
- Turn the heap after 6 weeks
- Compost is ready in 3-4 months

C:N Ratios of Common Materials

Browns = High Carbon	C:N	Greens = High Nitrogen	C:N
Ashes, wood	25:1	Alfalfa	12:1
Cardboard, shredded	350:1	Clover	23:1
Corn stalks	75:1	Coffee grounds	20:1
Leaves	60:1	Food waste	20:1
Newspaper, shredded	175:1	Garden waste	30:1
Peanut shells	35:1	Grass clippings	20:1
Pine needles	80:1	Hay	25:1
Sawdust	325:1	Cow Dung	15:1
Straw	75:1	Seaweed	19:1
Wood chips	400:1	Vegetable scraps	25:1

What Happens During The Process

- Breakdown stage
  - Starts within a couple of days
  - The pile heats up to 50-70 degrees centigrade
  - Pasteurizes the pile and kills the pathogens and eggs of parasitic worms
  - pH is acidic (5.5-6.5)
  - The amino acids in the protienaceous material are busy breaking down the carbon
  - Thermophyllic bacteria are active
  - ActinomycetesStreptomyces are active. They produce antibiotics which prevent proliferation of mineralizing bacteria & this prevents loss of valuable nutrients. They also prepare the field for the fungi which follow.
  - Temperature too high indicates the pile is too tightly packed and will need to be turned. Otherwise you will end up with ash rather than compost
  - Temperature too low indicates materials too damp or not in correct proportion
  - Lasts about 2-3 weeks

What Happens Continued

- Build Up Stage
  - Temperature drops down to 45 degrees centigrade
  - pH is neutral
  - Mesophyllic bacteria are active
  - Grinders, crustaceans, earth worms etc. come into the heap from the surroundings
  - The fungi multiply & further attack the cellulose and lignin fibres
  - Compost is turned during this period
  - Lasts about 3-4 weeks
  - Compost may be used during this stage

What Happens Continued

- Stabilization stage
  - Temperature drops to ambient levels
  - pH will be 7+ (slightly alkaline)
  - The free Nitrogen from the atmosphere is fixed by the Nitrogen fixing bacteria
    - These need Calcium to multiply and the lime that was added helps
  - This is the best time to use the Compost

Application

- Quantity
  - Vegetables
    - 10 tons/acre (3-4 compost heaps)
  - Paddy
    - 5 tons/acre (1-2 compost heaps)
  - Tea/Coffee
    - 3 tons/acre (1 compost heap)
- Time
  - Best before start of monsoon.
    - So start making the pile accordingly
  - Add Mulch after spreading
    - Prevents from nutrient loss
    - Protects from soil organisms from direct sunlight

Additional Facts

- Don’t use too much coir pith. It has excess of lignin which suppresses growth
- Composting can be speeded up by shredding the material
- Invest in a good thermometer – long metal one can measure up to 100 degrees Centigrade
- Protect from heavy rains. Otherwise the nutrients will leach out
- Adding Rock dust on a chemical farm is useless.
  - In a organic farm, the microbes digest it and upon their death give it in a form that is assimilable by plants
- Ideal CN ratio for the starting material is 25-30:1
- Make sure that the starting materials are not from a chemical farm.
  - The fungicides will eliminate the beneficial fungi which are very important for converting the rough organic matter to humus