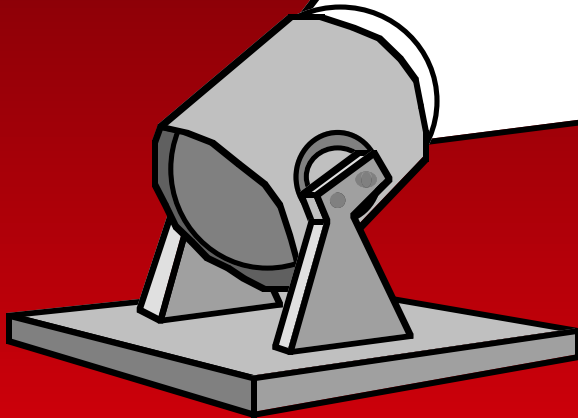
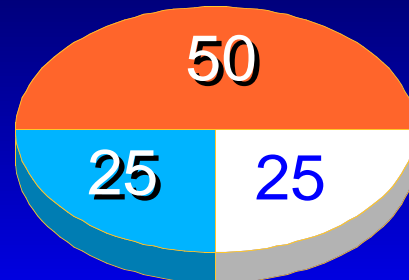
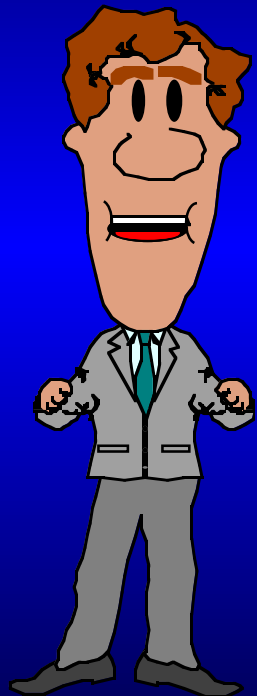


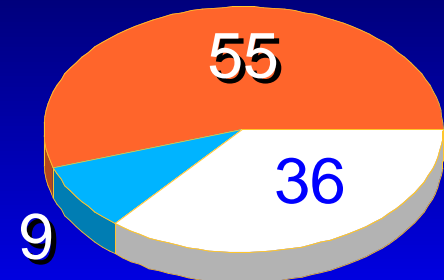
# Amending Urban Soils



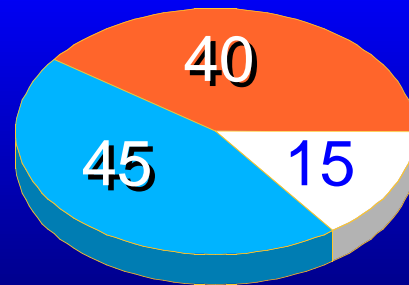
# Solids, Water, & Air



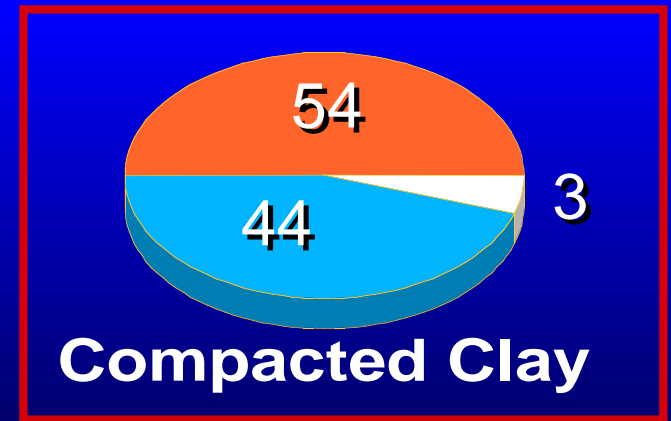
**Ideal Soil**



**Sandy Soil**



**Clay Soil**



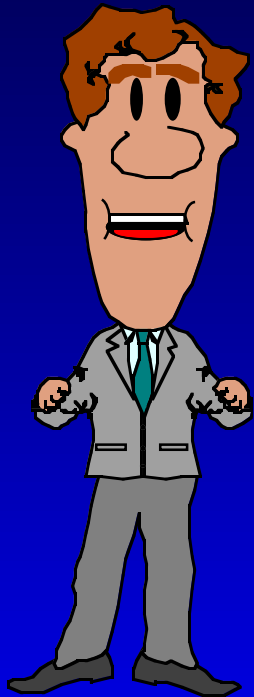
**Compacted Clay**



# Recommendations

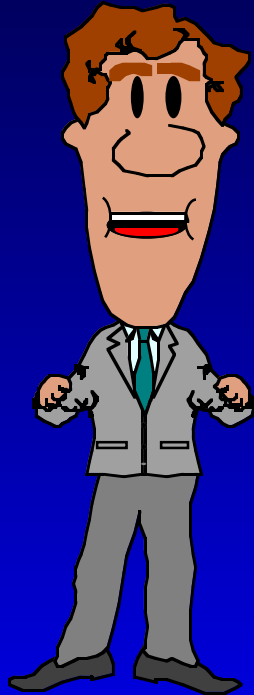
How much?

25 to 50% by volume



# Recommendations

How Deep?

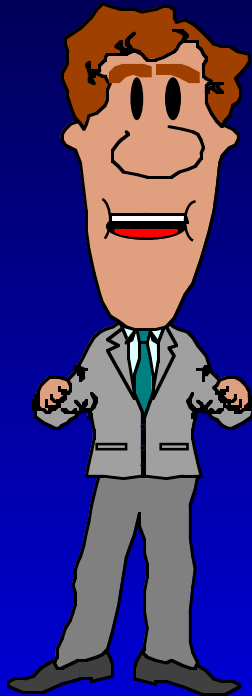


As deep as you  
can get it!

# DATA?



# Soils

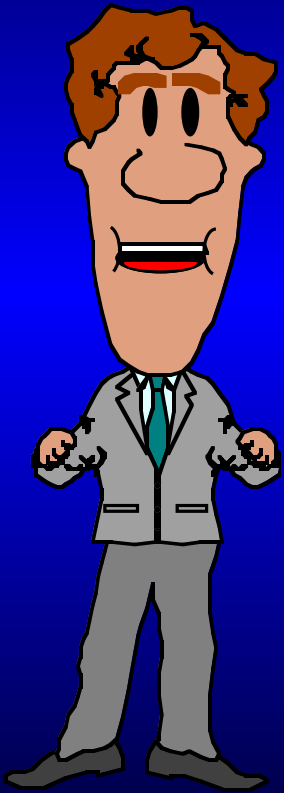


- ▶ Loamy sand
  - 82% sand
  - 12% silt
  - 6% clay
- ▶ Clay
  - 38%
  - sand
  - 12% silt
  - 50% clay

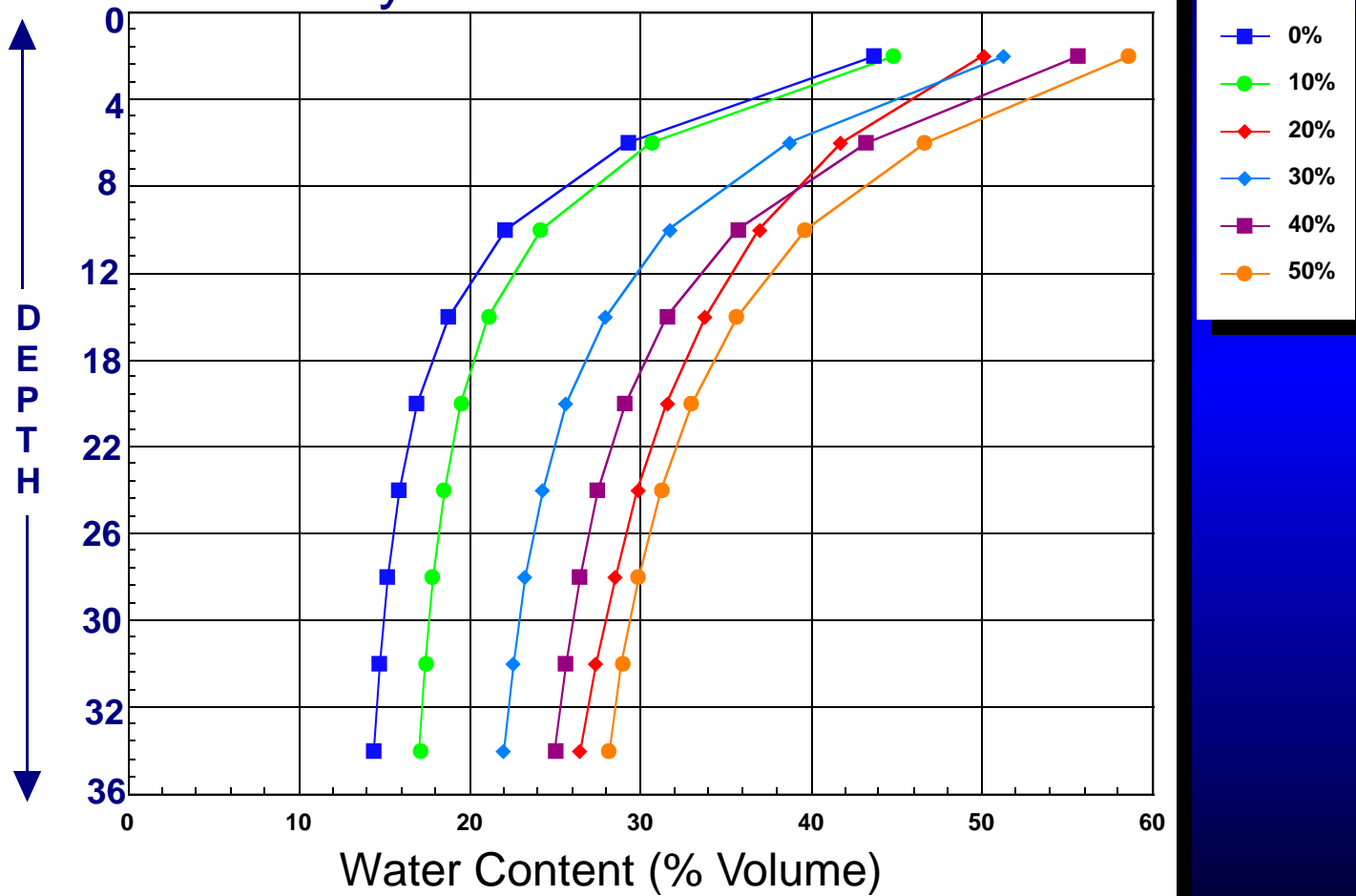
# Amendments

- ▶ Canadian sphagnum peat moss
- ▶ Aged pine bark ( $\leq 0.5$  in.)
- ▶ Rates: 10, 20, 30, 40, 50%  
by volume

# Drainage Profile

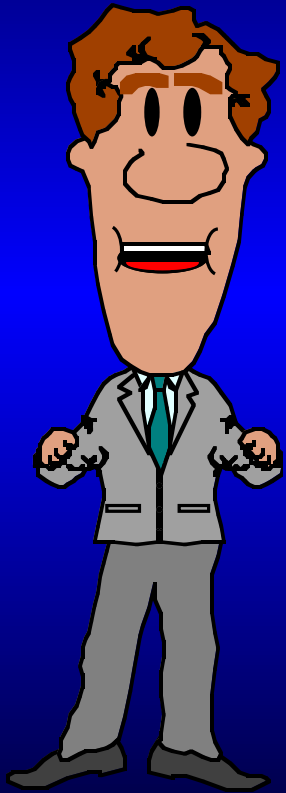
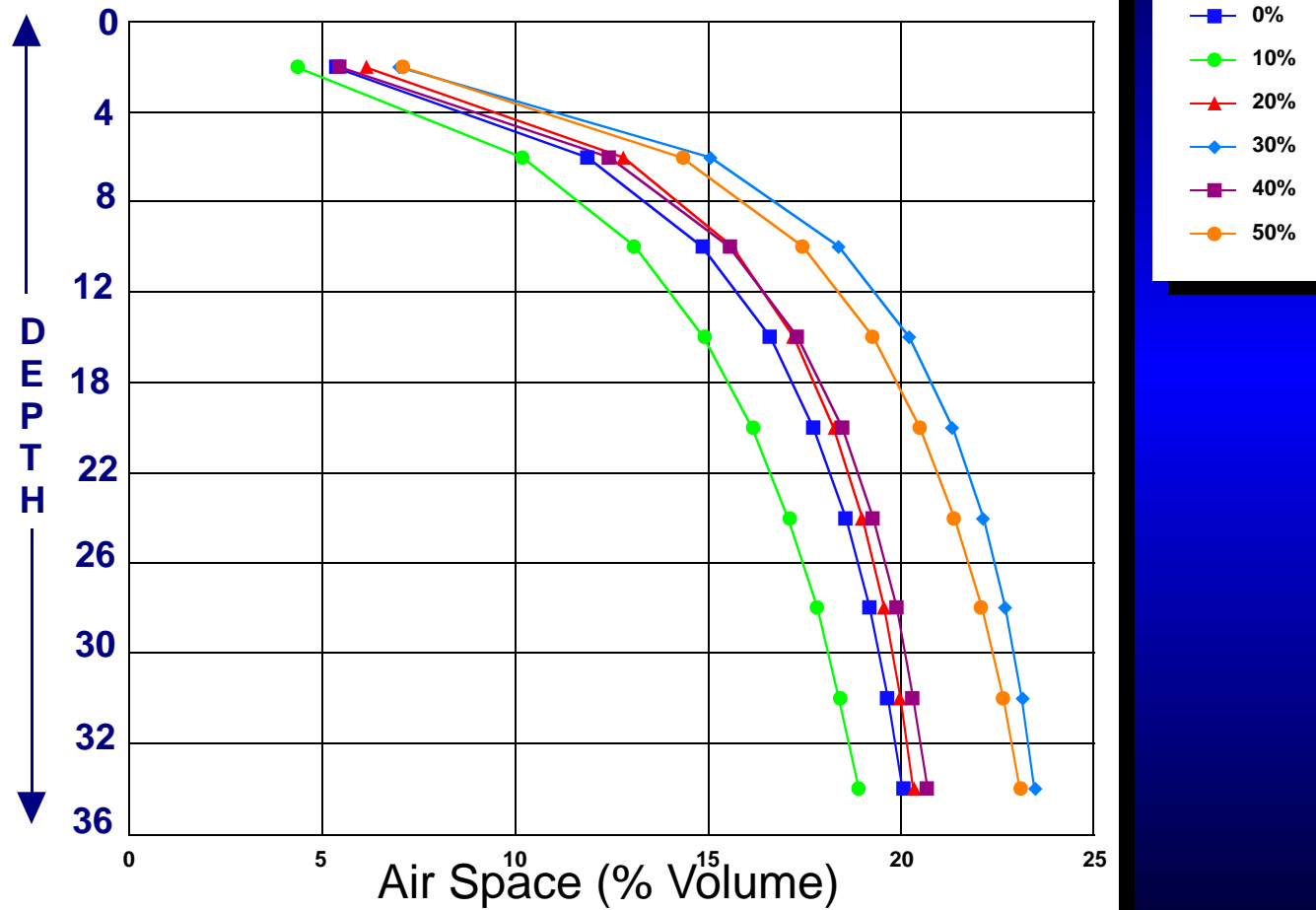


## Sandy Soil - Peat Additions



# Drainage Profile

## Clay Soil - Bark Additions



# Amendment Strategies

Untreated

A solid dark orange vertical rectangle representing a soil profile that has not been treated or amended.

Tilled  
6 inches

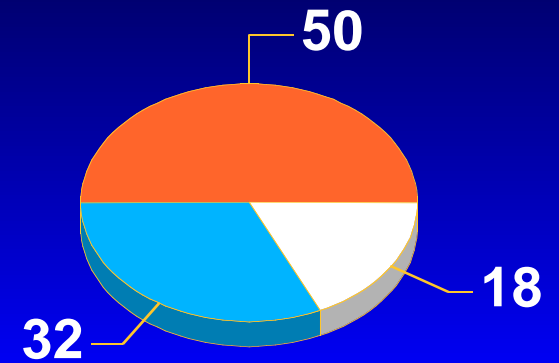
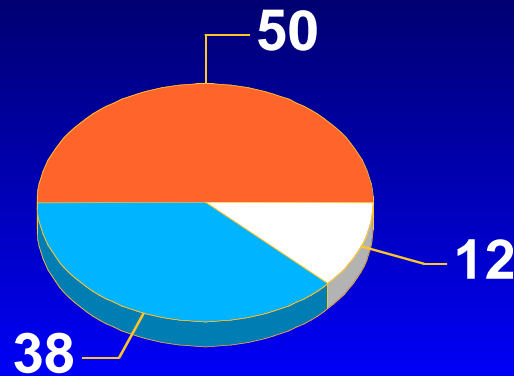
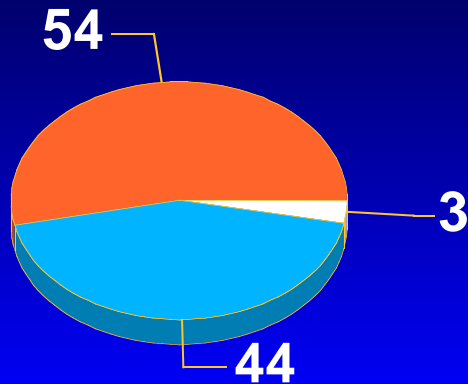
A vertical rectangle representing a soil profile where the top 6 inches are a lighter orange color, indicating tilling, while the bottom 18 inches remain dark orange.

Tilled  
6 inches

Subsoiled  
18 inches

A vertical rectangle representing a soil profile where the top 6 inches are a lighter orange color (tilling) and the bottom 18 inches are a dark orange color with a vertical wedge-shaped lighter orange area extending downwards from the tilled layer, representing subsoiling.

# Clay Soil - Unamended



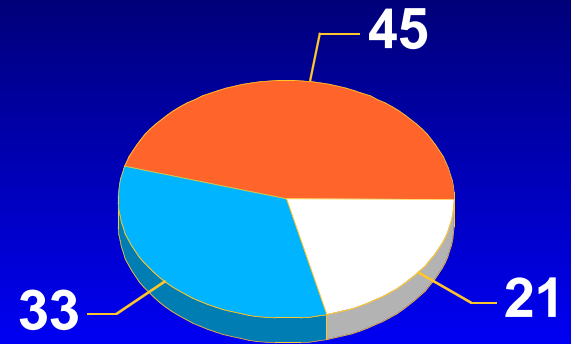
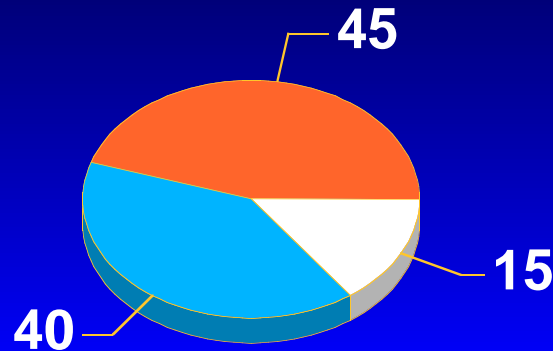
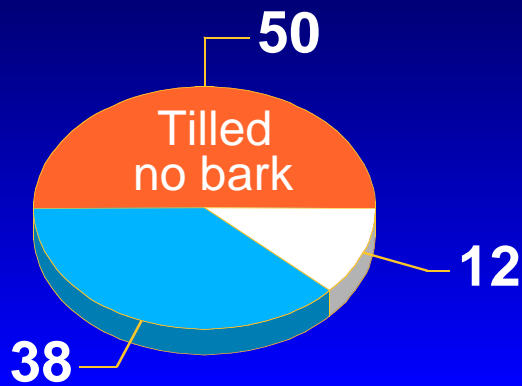
Compacted

Tilled  
6 inches

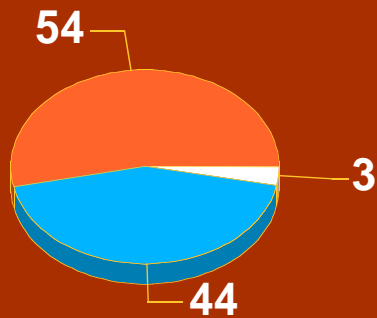
Tilled  
6 inches

Subsoiled

# Clay Soil - 30% Bark



Compacted



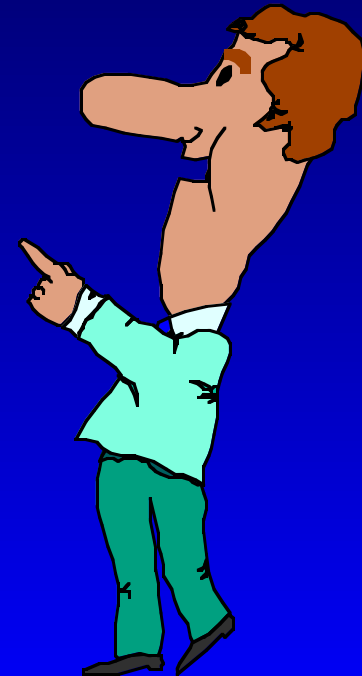
Tilled  
6 inches

Tilled  
6 inches

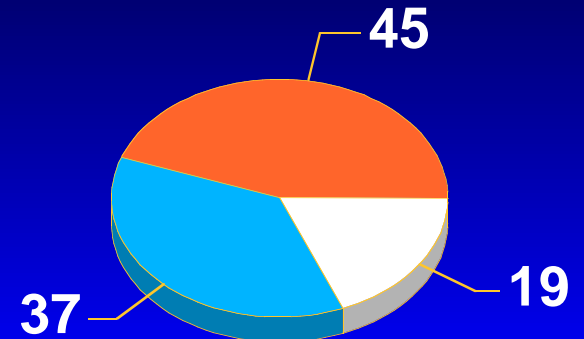
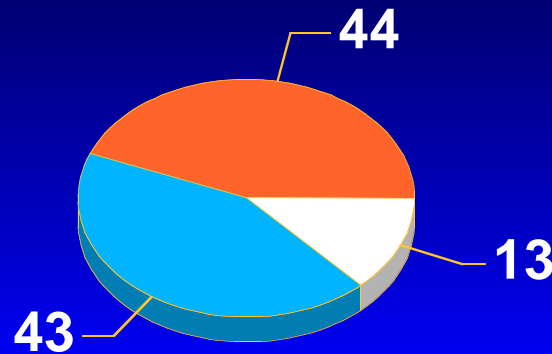
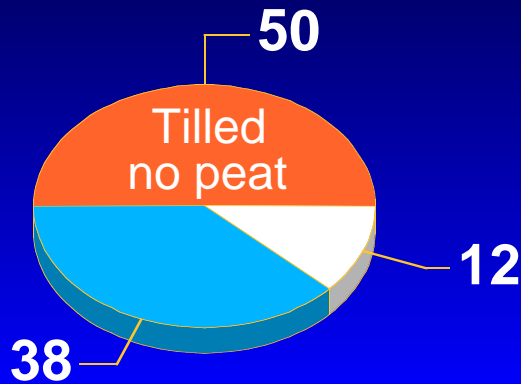
Subsoiled

# Clay Soils - Bark

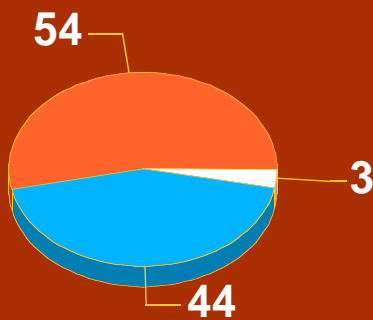
- ▶ Biggest improvement:  
tilling / subsoiling
- ▶ 10% & 20% - no improvement  
over tilling/subsoiling alone
- ▶ 30% best air/water balance



# Clay Soil - 30% Peat



Compacted



Tilled  
6 inches

Tilled  
6 inches

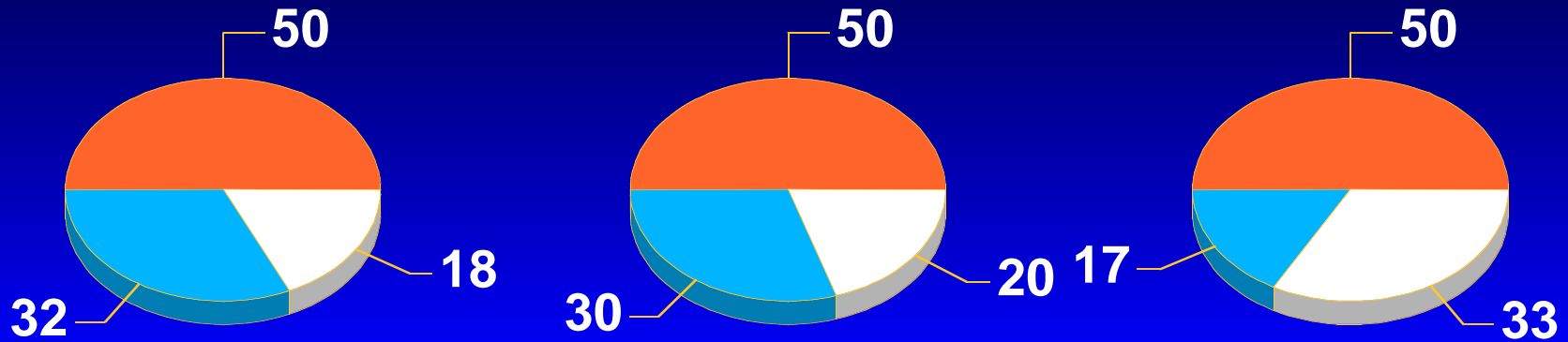
Subsoiled

# Clay Soils - Peat

- ▶ Biggest improvement:  
tilling / subsoiling
- ▶ 10% & 20% - decreased air
- ▶ 30% improved air but also  
increased water content



# Sandy Soil - Unamended



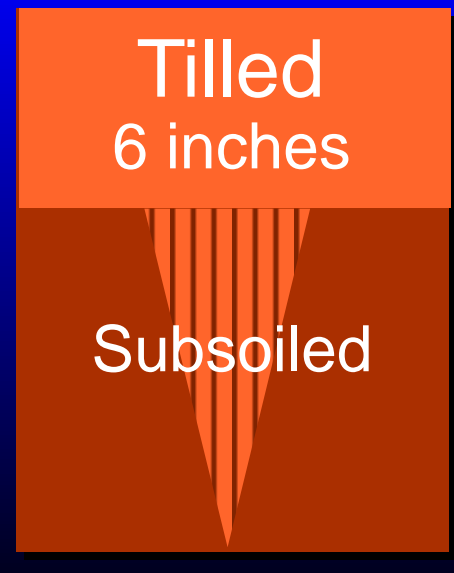
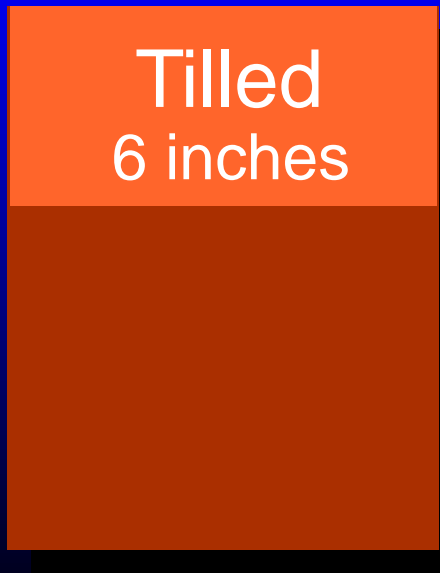
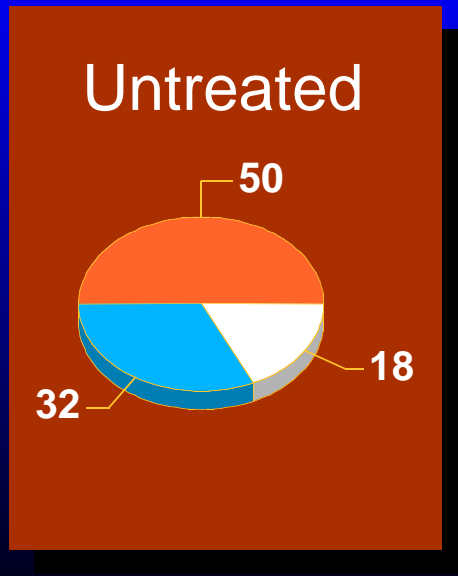
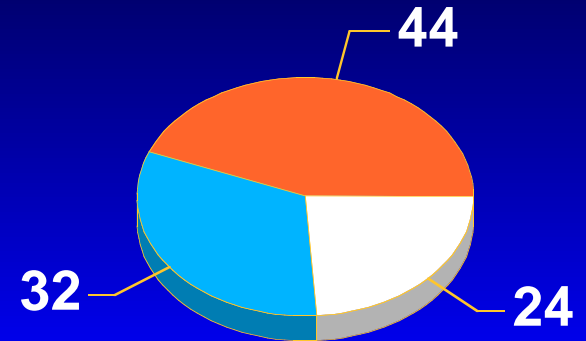
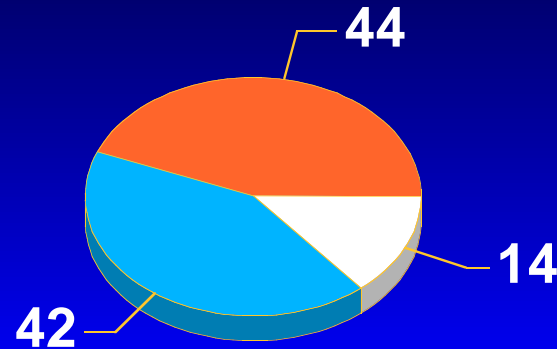
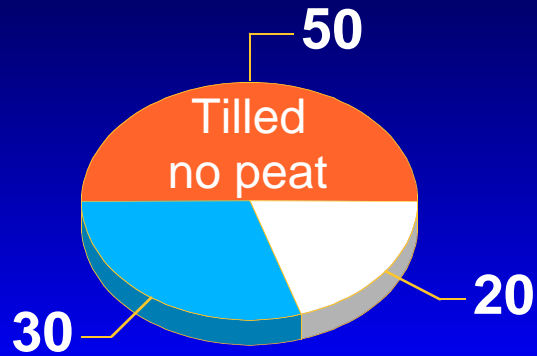
Untreated

Tilled  
6 inches

Tilled  
6 inches

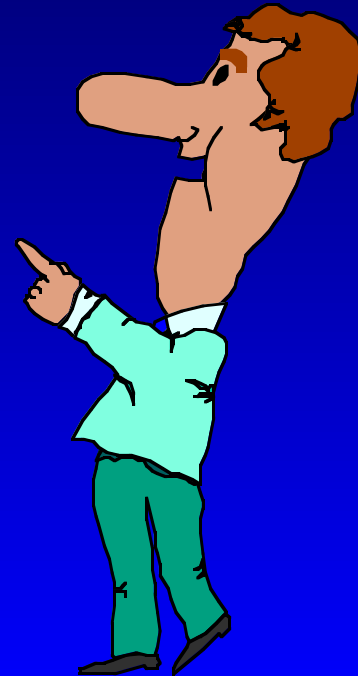
Subsoiled

# Sandy Soil - 20% Peat

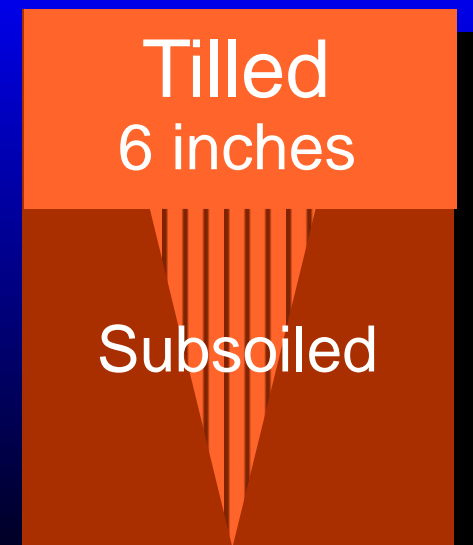
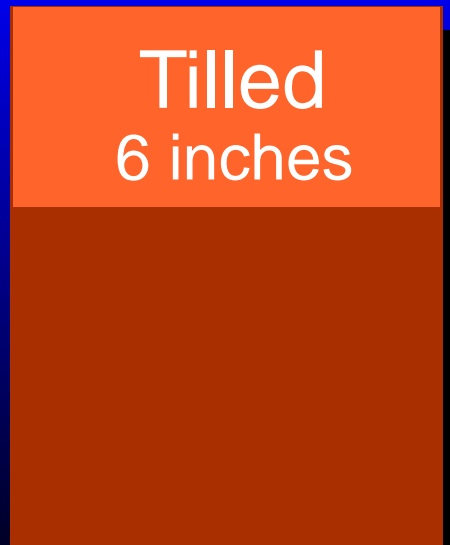
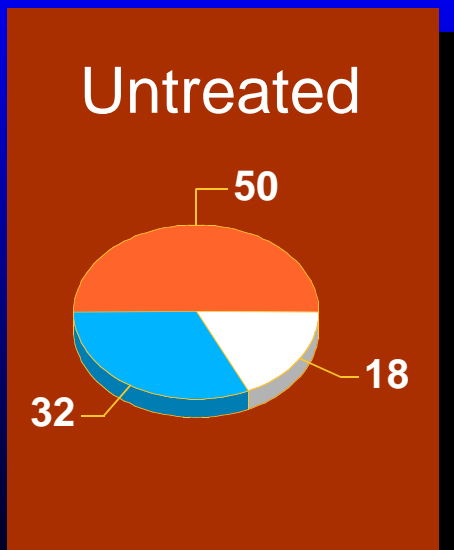
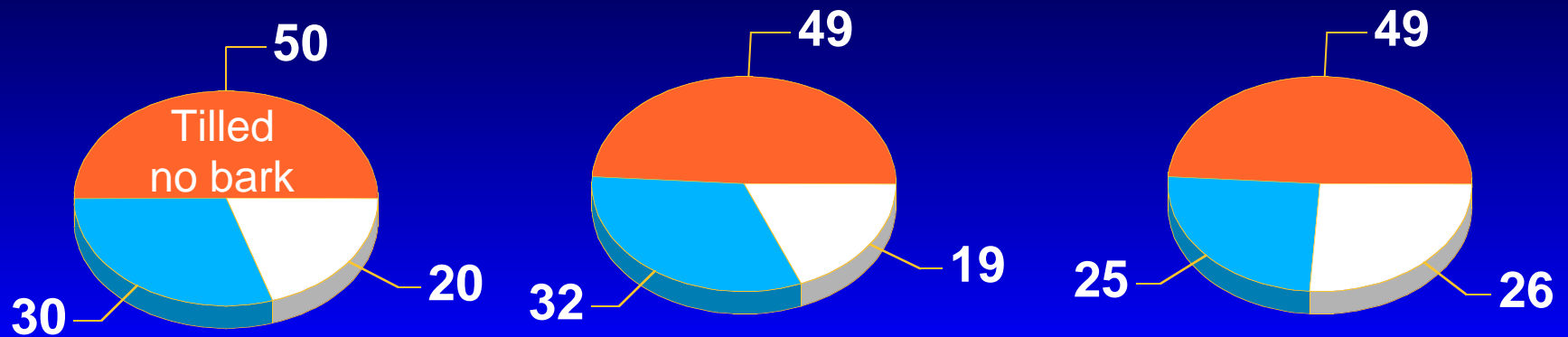


# Sandy Soils - Peat

- ▶ 20% best air/water balance
- ▶ Subsoiling - no improvement
- ▶ 10% - no help
- ▶  $> 20\%$  no improvement



# Sandy Soil - 20% Bark

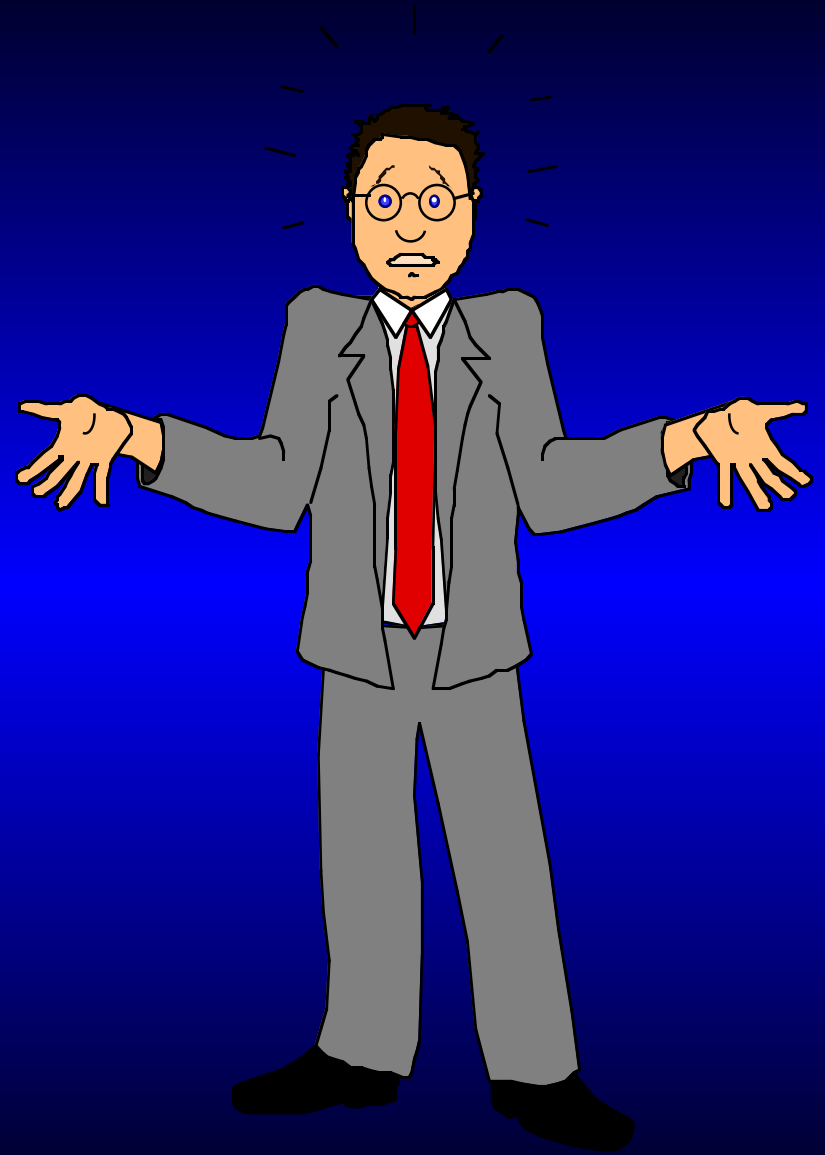


# Sandy Soils - Bark

- ▶ 0 & 10% - same
- ▶ Improved water content  
(20-30) & (40-50)
- ▶ Subsoiling - no  
improvement



What  
does all  
this  
mean?



# Recommendations

30% pine bark (6 inches)  
& Subsoil



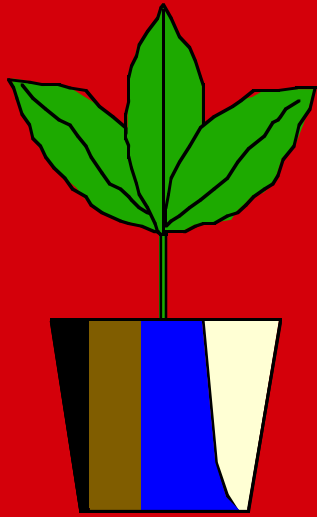
Clay  
Soils

# Recommendations

$\geq 20\%$  peat  
(6 inches)



Sandy  
Soils



# HORTICULTURAL SUBSTRATES LABORATORY

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