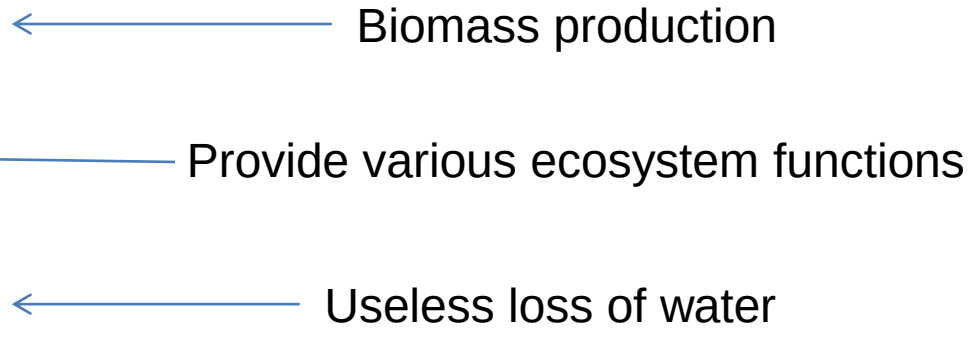
Average Yields at Lahoma (2008-2011)

Cropping System	Yield
	Bu/acre
CT Wheat	45
NT Wheat	44
NT Wheat After Canola	57

Improved yield can be attributed to decreased weed and disease pressures

Water Utilization

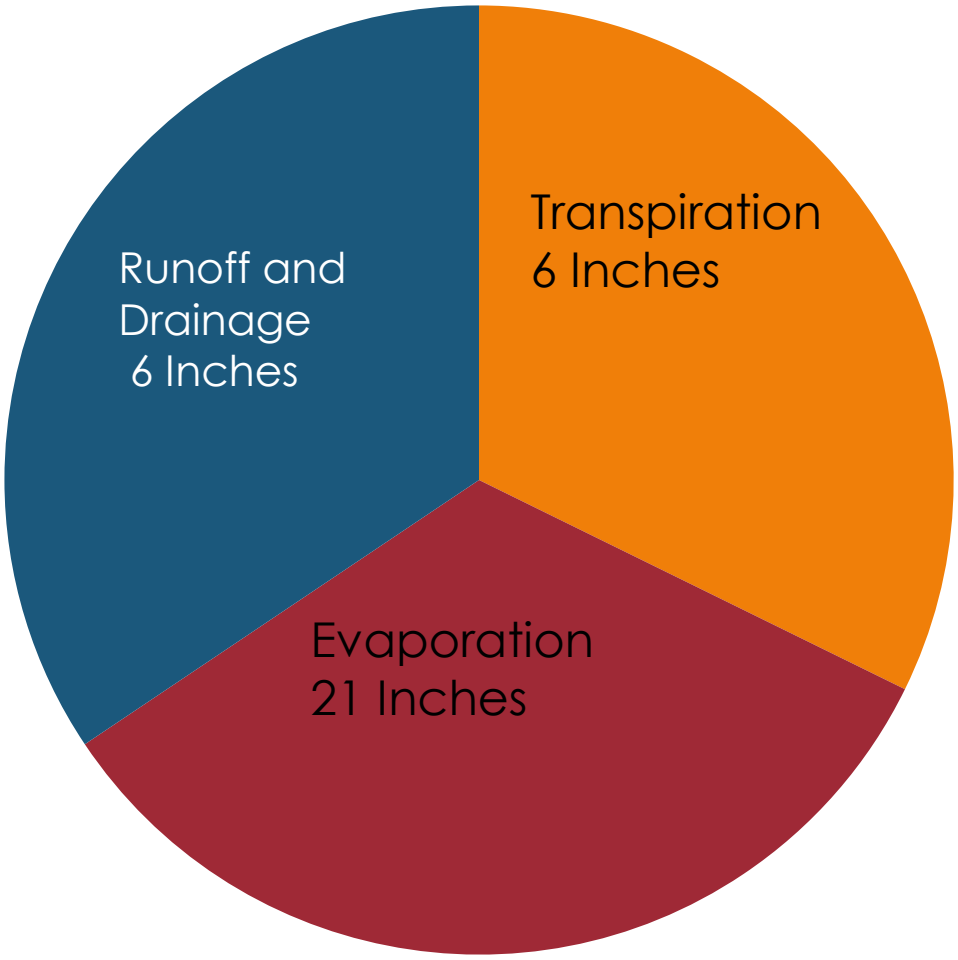
- Crop rotations can be developed to optimize water use efficiency
- Rainfall can leave a soil system through:
  - Transpiration
  - Runoff
  - Drainage
  - Evaporation



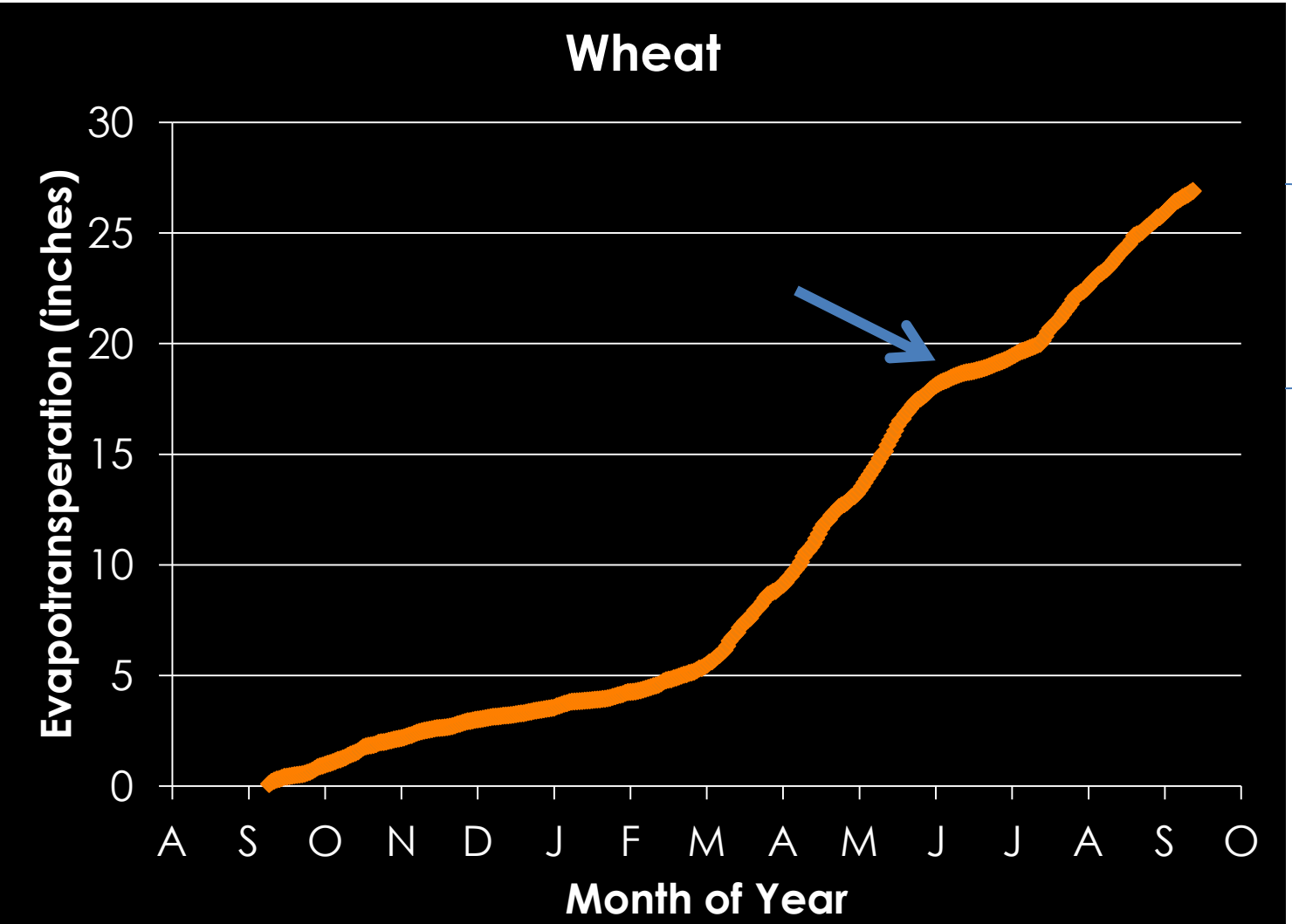
Transpirational Water use in OK

	Average yield	Average yield	WUE	Transpiration
		lbs acre^{-1}	lbs acre^{-1} inch^{-1}	inches
Winter wheat	33 bu	1980	317	6.2
Alfalfa	3.3 tons	6600	473	14.0
Corn	90 bu	5040	580	8.7
Sorghum	45 bu	2520	435	5.8
Soybean	23 bu	1380	240	5.8
Cotton	0.75 bale	360	100	3.6
Rye	20 bu	1120	310	3.6

Water budget for Continuous Wheat



Evapotranspiration during the Wheat growing Season (Mesonet at Lahoma)



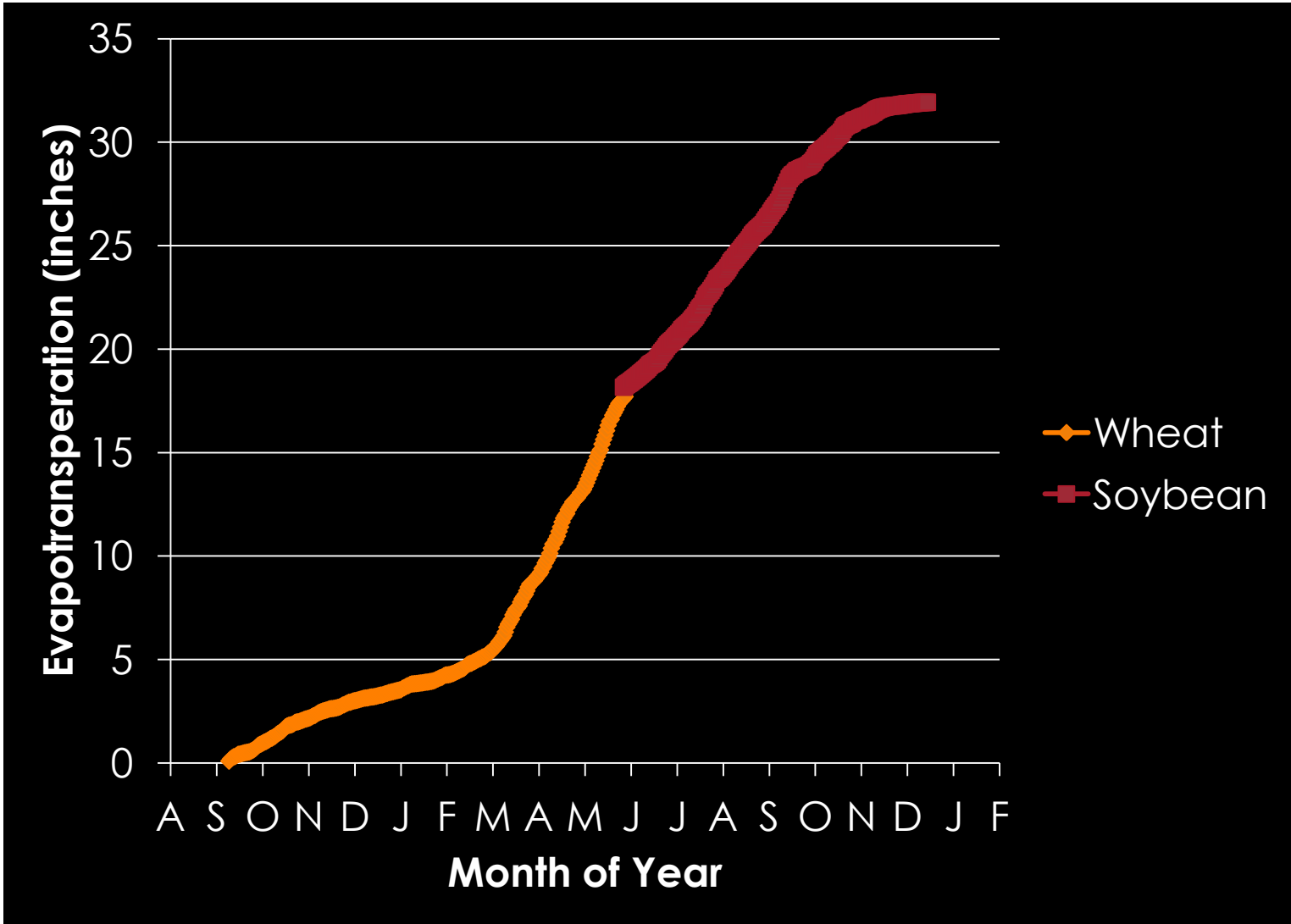
9 inches of water lost during Fallow

A Double Cropping Example

Double Crop example

- Replacing the fallow period will transfer evaporative water loss to productive transpiration water loss

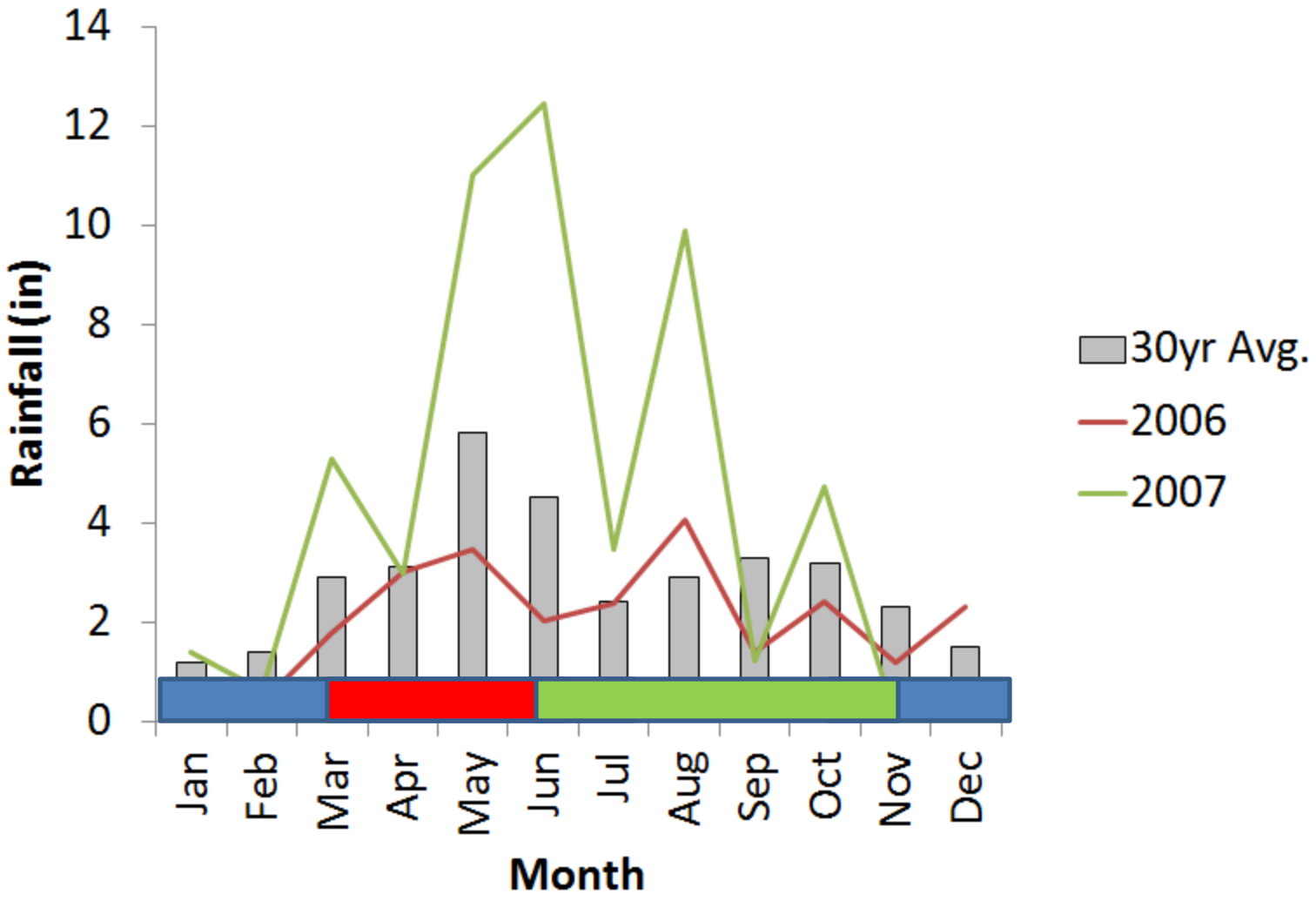
Cumulative ET

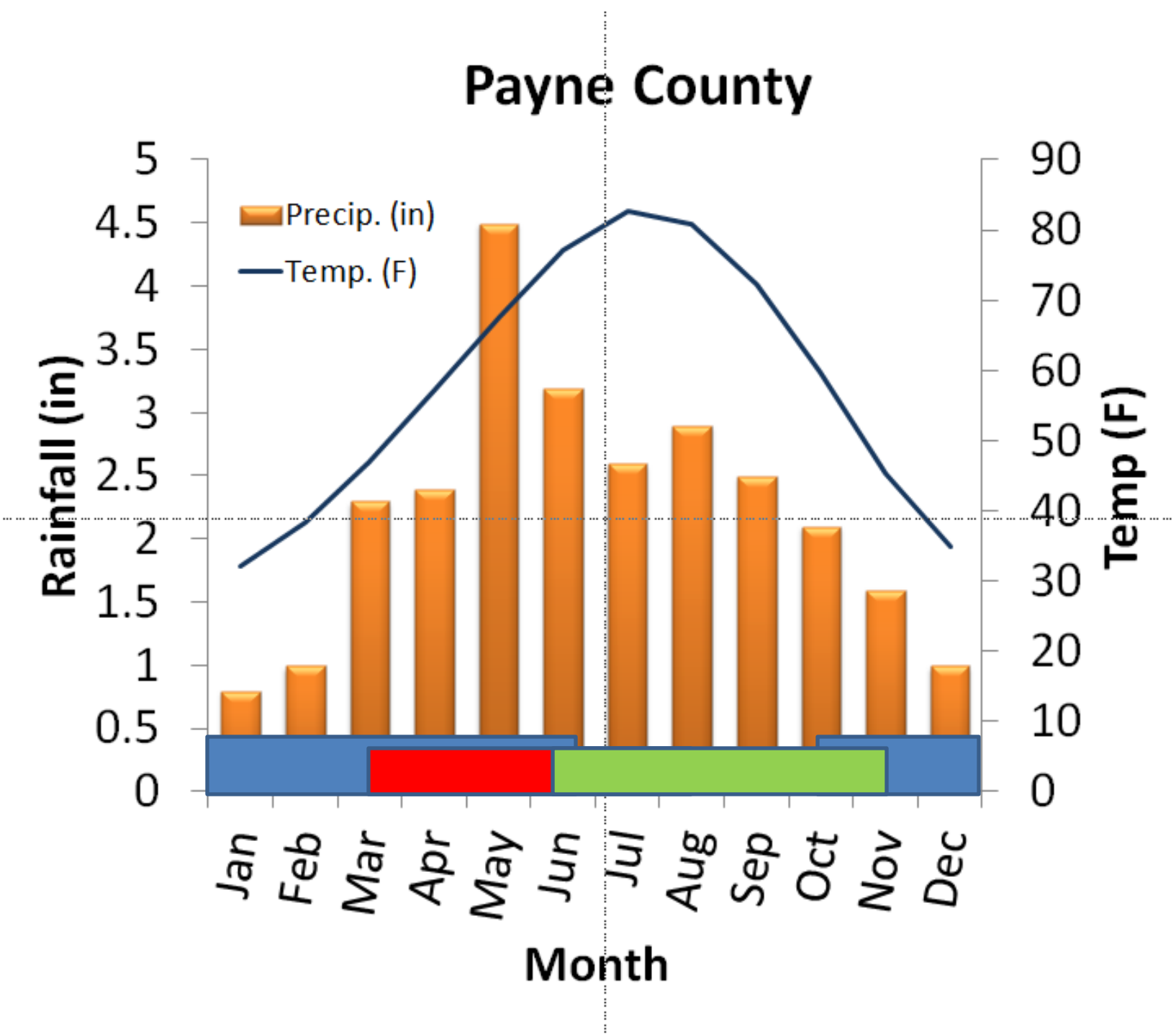


Importance of rainfall amount and Distribution

- The amount of rainfall is of course important
- The distribution is equally important
- Water holding capacity of the soil is also an important consideration
  - Provides resilience to short droughts.

Bimodal distributions of rain




Payne County
Precip. (in)
Temp. (F)
Rainfall (in)
Temp (F)
Month
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0
10
20
30
40
50
60
70
80
90
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

Realizing the Benefits of Crop Rotation

- Benefits can be realized in most any form of rotation
  - The diversity of soils and climatic conditions results in a large variety in rotations found in Oklahoma.
  - Provides many opportunities and challenges for agronomic professionals and conservationist.

Realizing the Benefits of Crop Rotation

- Rotation intensity and length are dictated by
  - The amount of rainfall and its distribution.
  - Knowledge level of producer
    - Complex rotations require more planning that simply rotations
    - Each crop is different therefore with more crops comes the need for more information
  - Pest pressures
  - Must also consider temperature regime.

Factors to consider when developing a Rotation

- Commodity prices
- Soil Productivity
- Rainfall distribution and amount
- Insect and disease interactions among crops
- Herbicide interactions
- Residue management in no-till system
  - Can I establish the next crop in the current crops residue or lack of residue?