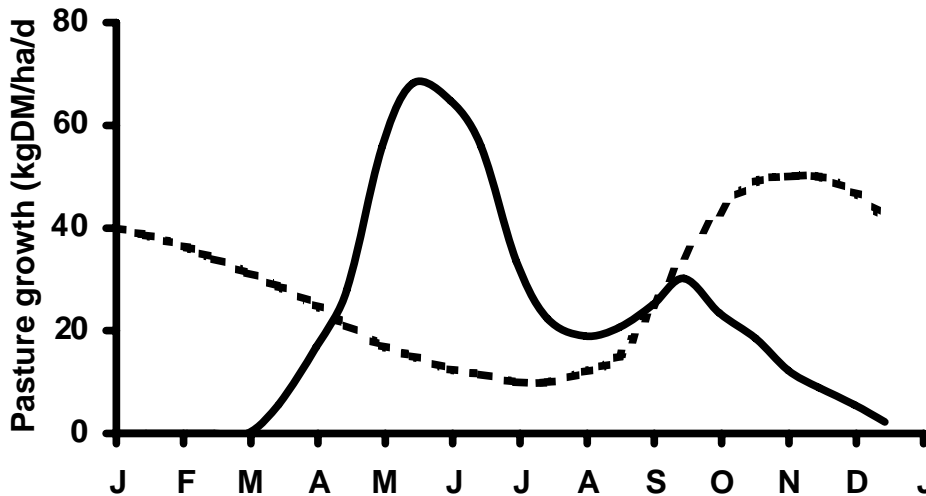


## Seasonality (pg 187-190)

### Ohio pasture growth curve



### Climate drives seasonality

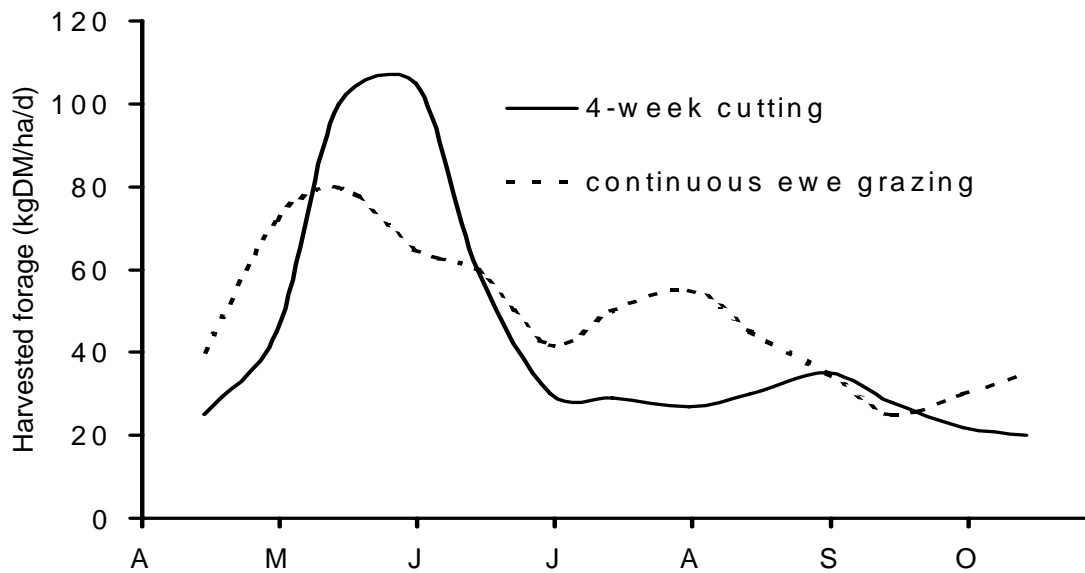
- ♣ Spring – .....  
 .....  
 ❖ Vigorous reproductive phase E growth is 15% greater than would be predicted from climate alone. Physiological studies have not found inherently greater efficiency, but rather i) .....  
     ▪ ii) .....  
     ▪ iii) .....  
     ▪ iv) .....  
 ❖ Initial spring growth .....
- ♣ Summer – ..... decrease growth.  
 Lowest forage quality – due to .....
- ♣ Fall – ideal growth conditions, critical period for .....
- ♣ Winter – freezing injury, cold prevents any growth, only small variation (1-2 weeks) in duration of winter

### Implications of seasonality

- ❖ Inconsistent .....
- ❖ Need .....
- ❖ Typically in USA this involves housing livestock and confinement feeding, however lower a cost option is to explicitly manage seasonal growth and the seasonal supply of forage

## Manipulating seasonality

- ❖ Many options but .....
- ❖ Grazing:
  - a) Close fall grazing can .....
  - .....
  - b) Infrequent spring grazing can .....
  - .....
  - c) Close late-spring grazing can .....
  - .....
  - d) Close summer grazing can .....
  - .....



- ❖ Fertilizer management:
  - Fertilized forage has .....
  - During drought – forages are .....
  - Fall K applications can .....
  - Shoulder-season production is increased by fertilizing – but .....
- ❖ Irrigation will .....
- ❖ Forage management. Short-term surplus or deficit of forage will .....
- ❖ Stockpiled forage during Fall can ..... (pg 188)

Species effects

- ❖ C3 and C4 species. Warm-season grasses have poor ..... production, but high ..... production. Seasonal growth patterns are complementary with ..... In Ohio warm-season grasses have less annual yield but high summer production. They are not widely used in Ohio, greater use in western and southern states
- ❖ Grasses and legumes. Complementary growth patterns – white clover, red clover and alfalfa all have .....
- ❖ Grasses have different flowering dates and hence different peaks in spring growth. Annuals are typically earlier than perennials, cultivar differences can be larger than differences between species (see early and late varieties of orchardgrass – OSU)
- ❖ Orchardgrass and fescue have better summer production, timothy and kentucky bluegrass have poor summer production E a case for mixing these i) within fields, ii) within a farm
- ❖ Shoulder season production can be achieved with annuals (ryegrass, cereal rye, turnips). There are few options in permanent grasslands.

Excel spreadsheet – Managing the forage growth pattern

Model parameters

- a)
- b)
- c)
- d)
- e)
- f)

Stocking Rate	10 lbP/ac			30 lbP/ac	
	0 N	125 lbN/ac		0 N	125 lbN/ac
Low stocked (surplus hay)	\$12,910	\$16,710		\$17,610	\$21,370
Balanced (all hay consumed)	\$13,240	\$17,110		\$18,090	\$21,850
High stocked (purchase extra hay)	\$13,950	\$18,040		\$18,900	\$23,090
Super stocked (no hay made)	\$16,050	\$21,030		\$22,020	\$26,980