

Pastureland Value Calculation

Conceptualization:

- Forage isn't harvested and there is no market for it (like there is for hay or corn), so can't directly develop its economic value for estimating net income that can then be capitalized.
- However, methods have been developed to estimate forage productivity through how many animals it can sustain—that is, how much can be “harvested” by animals.
 - This provides an opportunity to economically relate forage (unharvested crop) to hay (harvested crop).

Pastureland Value Calculation

Methodology:

- Land's forage productivity is measured in the form of the standardized system of “animal unit months”—amount of forage required to keep one animal unit for one month.
- Once that productivity value is determined, the grazing income value (revenue that can be generated from grazing on an acre of land) can be approximated using the NH price of hay.
- After accounting for costs, the net grazing income can be capitalized into a land assessment value.

Pastureland Value Calculation

Grazing value per animal unit =
(Minimum forage quality factor) ×
([0.75 × AU lactating cow] + [0.25 × AU heifer or calf]) ×
(NH price of hay per ton)

Grazing income per acre =
(NH pastureland productivity, au/acre) ×
(Grazing value, \$/au)

Net grazing income per acre =
(Grazing income per acre) × 0.75

Pastureland capitalized value =
(Net grazing income per acre) / (Capitalization rate)

Pastureland Value Calculation

$$\begin{aligned} \text{Grazing value per animal unit} &= \\ &(0.12) \times \\ &([0.75 \times 1.4] + [0.25 \times 0.6]) \times \\ &(\$160) = \$23.09/\text{au} \end{aligned}$$

$$\begin{aligned} \text{Grazing income per acre} &= \\ &(1.0 \text{ au/acre}) \times \\ &(\$23.09/\text{au}) = \$23.09/\text{acre} \end{aligned}$$

$$\begin{aligned} \text{Net grazing income per acre} &= \\ &(\$23.09) \times 0.75 = \$17.32 / \text{acre} \end{aligned}$$

$$\begin{aligned} \text{Pastureland capitalized value} &= \\ &(\$17.32 / \text{acre}) / (9.55\%) = \$181.32 / \text{acre} \end{aligned}$$

Model

MODEL INPUTS		
ADMINISTRATIVE INPUTS		
DATE OF MODEL		9/21/23
CURRENT YEAR		2022
USED IN TAX YEAR		2023
LAND ALLOCATION INPUTS FOR CROP PRODUCTION		
ACRES IN CORN FOR SILAGE		1.00
ACRES IN HAY		1.20
ANIMAL UNITS AND HERD COMPOSITION		
LACTATING COW (AU)		1.40
CALF/HEIFER (AU)		0.60
PROPORTION HERD AS CALVES/HEIFERS		0.25
PRODUCTION INPUTS		
OLYMPIC AVG YIELD, CORN FOR SILAGE (TON/ACRE)	YEARS: 2018–2022	20.33
OLYMPIC AVG YIELD, HAY (TON/ACRE)	YEARS: 2018–2022	1.70
MULTIPLIER TO CALCULATE MAX SILAGE YIELD		1.2073
MULTIPLIER TO CALCULATE MAX HAY YIELD		1.5606
MULTIPLIER TO CALCULATE MIN FORAGE QUALITY		0.12
PASTURELAND PRODUCTIVITY (AU/ACRE)		1.00
MARKET INPUTS		
OLYMPIC AVG PRICE OF CORN FOR SILAGE, (\$/TON)	YEARS: 2018–2022	46
OLYMPIC AVG PRICE OF CORN FOR GRAIN, AVG PA+NY, (\$/BU)	YEARS: 2018–2022	5.52
OLYMPIC AVG PRICE OF HAY, (\$/TON)	YEARS: 2018–2022	160
COST MULTIPLIER, CORN FOR SILAGE		0.8970
COST MULTIPLIER, HAY		0.9565
COST MULTIPLIER, PASTURE		0.75
CAPITALIZATION RATE INPUTS		
OLYMPIC AVG 5-YEAR USDA FSA LOAN RATE GUARANTEE	YEARS: 2018–2022	7.35%
OLYMPIC AVG NH MUNICIPAL TAX RATE	YEARS: 2018–2022	2.20%

MODEL OUTPUTS	
PRODUCTION OUTPUTS	
MAX SILAGE YIELD (TON/ACRE)	24.55
MAX HAY YIELD (TON/ACRE)	2.65
MIN PASTURELAND VALUE (\$/AU)	23.09
NET INCOME	
MAX NET INCOME, CROPLAND, (\$/ACRE)	62.78
MIN NET INCOME, PASTURELAND, (\$/ACRE)	17.32
CAPITALIZATION RATE	
CAPITALIZATION RATE	9.55%
CAPITALIZED AGRICULTURAL LAND VALUE	
MAX AG LAND VALUE, (\$/ACRE)	657
MIN AG LAND VALUE, (\$/ACRE)	181

*Note: Values in above example are for demonstration purposes only.

Model Outputs

MODEL OUTPUTS

PRODUCTION OUTPUTS

MAX SILAGE YIELD (TON/ACRE)	24.55
MAX HAY YIELD (TON/ACRE)	2.65
MIN PASTURELAND VALUE (\$/AU)	23.09

NET INCOME

MAX NET INCOME, CROPLAND, (\$/ACRE)	62.78
MIN NET INCOME, PASTURELAND, (\$/ACRE)	17.32

CAPITALIZATION RATE

CAPITALIZATION RATE	9.55%
---------------------	-------

CAPITALIZED AGRICULTURAL LAND VALUE

MAX AG LAND VALUE, (\$/ACRE)	657
MIN AG LAND VALUE, (\$/ACRE)	181

} Agricultural Productivity

} Net Income

} Capitalization Rate

} Agricultural Land Value Range

Implementation, Example

Phase-in year	Old assessment range	New assessment range*	Weight on old assessment values	Weight on new assessment values	Phased-in assessment range†
1	\$25–425	\$181–657	80%	20%	\$56–471
2	\$25–425	\$181–657	60%	40%	\$87–517
3	\$25–425	\$181–657	40%	60%	\$118–564
4	\$25–425	\$181–657	20%	80%	\$150–610
5	\$25–425	\$181–657	0	100%	\$181–657

* New assessment range values are for demonstration purposes only. Actual values may go up or down annually depending on market conditions associated with agricultural input costs and agricultural product prices in different years.

† Unproductive land—defined as that which is incapable of producing crops—will be assessed at the lowest current use value established by the board for any category.

Assessed Tax Value

Phase-in year	Old assessment range	Tax amount at 2.2% rate and SPI=100	Tax amount at 2.2% rate and SPI=75	Phased-in assessment range	Tax amount at 2.2% rate and SPI=100	Tax amount at 2.2% rate and SPI=75
1	\$25–425	\$9.35	\$7.15	\$56–471	\$10.36	\$8.08
2	\$25–425	\$9.35	\$7.15	\$87–517	\$11.37	\$9.01
3	\$25–425	\$9.35	\$7.15	\$118–564	\$12.41	\$9.96
4	\$25–425	\$9.35	\$7.15	\$150–610	\$13.42	\$10.89
5	\$25–425	\$9.35	\$7.15	\$181–657	\$14.45	\$11.84

* New assessment range values are for demonstration purposes only. Actual values may go up or down annually depending on market conditions associated with agricultural input costs and agricultural product prices in different years.