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The study of method on estimating aerial net primary production of rangeland by remote sensing —A case study of Xilingol Grassland

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Key words : Rangeland -Remote Sensing Vegetation index Grazing intake Net primary production

Introduction The estimation for standing production of rangeland based on remote sensing(RS) has been reported largely(Huete & Jackson ,1987 ;Beck ,1990) ,but about grazing intake ,reported infrequently .

Material and method The study has tried to extract information both grazing intake and aerial NPP by RS . The relationship between GI of once every ten days gained from field test , and estimation model of standing production(SP) and GI index(GII) model extracted by MODIS material , as well as NPP models .

Result and discussion

1 SP model

According to relativity between NDVI and field data , estimation model for rangeland production has been established , the expression is as :

$$Y = \text{EXP}(5.77 - 0.42/X) ; X \text{ is NDVI} . \quad (1)$$

2 GI index

$$GI_{xun} = NDVI_{dangxun} - NDVI_{xiaxun} = b_0 \begin{Bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ M & M & \dots & M \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{Bmatrix}_{m \times n} \quad (2)$$

$a_{11} \sim a_{mn}$ are pixel values in MODIS material , b_0 is GI index .

3 GI model

$$\Delta y = \exp\{5.77 - 0.42/b_0\} , \quad (3)$$

4 Aerial NPP model

$$ANPP = \exp\{5.77 - 0.42/ndvi_{max}\} + \exp\{5.77 - 0.42/b_0\} \quad (4)$$

Conclusion In the paper , the logic of extracting GI is based on the assumption that the difference between NDVI of two decad days in border upon can be ignored or is zero . The limitation of quantitative analysis in the method is lack of verifying and test for results because of difficult to gather data of aerial NPP and GI in field .

References

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