INTRODUCTION

- Brassicas (Brassica sp.) are cool-season annual forages that can be grazed or harvested in as little as 45 days after planting (Hall and Jung, 2008; de Ruiter et al., 2009).
- Brassicas provide forage during the ‘summer forage slump’ and during the fall, resulting in up to 3 additional months of grazing annually (Hall and Jung, 2008).
- Brassicas contain a group of phytochemicals (glucosinolates) that can decrease palatability, decrease animal gains, and cause copper and iodine deficiencies in livestock.
- Brassicas have been linked to reductions in enteric methane emissions in ruminants (Reid et al., 1994; Dillard et al., 2017).
- Little information regarding yield, nutritive quality, or glucosinolate concentration of new forage brassica varieties is available for livestock producers.

Objective:
- Determine yield, nutritive quality, and glucosinolate concentration of 3 brassica varieties compared with annual ryegrass grown during the fall grazing season in central Pennsylvania.

METHODS

- Field plot study conducted at the Pennsylvania State University Russell Larson Agricultural Research Farm, Rock Springs, PA.
- Forage Treatments (n = 4):
  - ‘KB Supreme’ Annual Ryegrass (ARG)
  - ‘Inspiration’ Canola (CAN)
  - ‘Barisca’ Forage Rapeseed (RAP)
  - ‘Appin’ Forage Turnip (TUR)
- Three random forage samples (4 cm stubble height) were taken biweekly during Oct. and Nov. of 2015 and 2016.
- Forage samples were composited within plot and sent to Dairy One Laboratories (Ithaca, NY) for wet chemistry analysis.
- Glucosinolates were determined using the methods of Dillard et al. (2017).

RESULTS

- Weather:
  - 2015: 69 d fall growing season
  - 2016: 76 d fall growing season
  - Mean air temp 14.8°C
  - Mean air temp 15.2°C
- Seasonal Biomass (Figure 1):
  - Significant forage × year interaction
    - 2015: Brassicas (RAP, CAN, and TUR) were greater than ARG
    - 2016: No difference among forages
- CP (Figure 2):
  - ARG had the greatest CP
  - RAP was greater in CP than TUR, with CAN intermediate among brassicas
  - No effect of year
- ADF (Figure 2):
  - ARG was greater in ADF than brassicas
  - No effect of year
- NDF (Figure 3):
  - ARG had greater NDF than brassicas
  - No differences in NDF among brassicas
  - NDF greater in Fall 2015 than Fall 2016
- Total Glucosinolates (Figure 4):
  - Significant year effect among brassicas
    - 2015: TUR > RAP > CAN
    - 2016: TUR > RAP > CAN
  - Glucobrassicanapin, glucobrassicin, gluconasturtiin, progoitrin, and gluconapin accounted for 95% of glucosinolates detectable in brassicas (data not shown).

CONCLUSIONS

- During cool, wet fall conditions, brassicas show potential to increase forage biomass by 423% compared with ARG.
- Brassicas are similar in biomass to ARG during warmer, drier fall conditions.
- However, forage quality of brassicas and ARG was not greatly impacted by meteorological differences between years.
- This also resulted in magnitudinal differences in total glucosinolate present in plant tissues.
- These data suggest that both productivity and the presence of anti-quality factors are largely influenced by meteorological conditions.

LITERATURE CITED