NE 1441

Annual Meeting 2015

NCSU Polk Hall August 17-18, 2015

August 17

In Attendance: Ann Swinker (Penn State), Krishona Martinson (UMN), Mike Westendorf (Rutgers), Bridgett McIntosh (VT), Betsy Greene (UVM), Masoud Hashemi (UMass), Carey Williams (Rutgers), Laura Kenny (Rutgers), Paul Siciliano (NCSU), Alexandria Garcia (NSCU grad student), Robert Causey (Maine), , Cassie ??? (UMass), Shannon Phillips (NCSU), Jennifer Gill (NCSU grad student)

On call: Carissa Wickens (UFL), Amy Burk (UMD), Jennie Ivey (TN) Becky Bott (SDSU)

Agenda: State Reports, Lunch, Animal and Poultry Waste Management Center, Beef Educational Unit, Equine Units.

Mike Westendorf: Waste to Worth session was a success, looking for hosts for next conference 2017. Penn State might do it. AWM conference, equine had full day session.

Thanks to Rebecca Bott and Krishona Martinson for JEVS nitrogen papers. Nitrogen paper was split into horse digestion and environment. Environmental one accepted with revisions, haven’t heard anything on digestion one.

Krishona: Review of Equine Grazing Research Methodologies, new paper, emailed sections out to people. Discuss tomorrow.

**State Reports**

Krishona Martinson, University of Minnesota

* Packaged cool season grass seed mixes, evaluated commercially available 12 mixes
  + Yield was same, 3 t/a
  + Most had KB, TF
  + Preference different, horses liked LaCrosee #4, Agassiz CHS#4. Plant 1 bag/acre. No orchardgrass at all. Over 30% OG, less preferred. Dakotas east and cool season grass line north would work.
  + OG took over even at less than 20% seed- over 80%. TF increased, KB stayed the same. Others disappear
  + 2 horses/acre
* Grazing pure legumes
  + Planted in May, grazed July-October. Horse people think you can’t graze it. Also not as hardy under most horse peoples’ pasture management. Small plots, horses graze 8h, sample, 2-3 days. No bloating, colic, diarrhea. Horses transition from grass/legume mix pasture.
  + CP high, NDF low, NSC higher than anticipated. No metabolic horses, no issues
  + Preference- red clover preferred, most pretty good.
  + Slobbers and photosensitivity concerns- photo mostly in white clover
  + Graze at bud stage
* Warm season grasses
  + Winterkill and flooding, need emergency forage. Horse people worried about sudangrass, millets
  + Graze at vegetative and mature
  + NDF a little high, approaching 60. NSC really low.
  + Teff hay
  + Preference- hate millets, like Sudangrasses and Teffs
  + Sudan- horses eat leaves and leave stems
  + Teff grows up to 8” then goes prostrate, lots of waste. Good emergency option, no nitrate or prussic acid issues. Hard to establish, light seed. Drill and pack it.
    - Bermuda easy to establish, would it grow fast enough?
  + Concerns with nitrate and prussic acid. Not recommending millet anywhere
* Emergency Forages
  + Small grains in spring and fall. 1.5-2 t/a
  + NSC in spring not so bad, 11-16; CP high, NDF fine
  + Fall added winter crops, similar nutrient qualities. Fall planted last through winter, can graze again in spring or cut or take to grain.
  + Preference- hate oats, like winter wheat and ryegrasses (highest NSC)
  + Graze vegetative, no boot stage at all
* Current projects
  + Yield and preference of teff at different heights
  + Seeding year mgmt of low lignin alfalfa
  + Legume-grass mixtures in horse pastures
  + Effect of hay rake type on exogenous ash content of alfalfa hay- lots of soil in hay, gopher mound fields.
    - Ann- cattle P intake was high, couldn’t reduce in feed, trace back to hay. High P soils.
* Equine Pasture Management Program
  + 9 farms this year
  + 5-10 acres, 2 over 80

Ann Swinker, Penn State University

* Extension Equine Team- 4 people, 2 grant-funded
* Env Stewardship Program major initiative. Work with NRCS, Conservation Districts.
  + 15-hr Env Stewardship short course. Education and hands on. Over 1000 farms attended 38 courses. Good evaluations
* SARE Equine Env Stewardship grant
  + Amish applied manure, fish kill downriver. Held hearing, was fined.
  + Increase canopy cover and desirable forage, reduce nutrient and sediment loss
  + Sacrifice lot construction. 80 horses, 160 acres
* Manure Management Plan Writing
  + 1 AU needs MMP
  + 27 workshops, 343 farm managers completed plans
* CIG Implementing and Marketing Environmental Stewardship on Small Farms and Equine Operations
  + Partnerships to increase avail of equipment and resources, develop recognition program for farms
  + 25 farms- not much interest, farmers may be afraid of DEP involvement
* No-till drill used on 18 farms, 82 acres reseeded, all species
* Parasite project, SARE grant
  + Parasite resistance. Educational workshops
  + 165 farm mgrs and veterinarians, 57 farms representing 306 horses. Monitor strongyle egg production and evaluate product efficacy, pre and post deworming egg counts
  + Farms conduct FEC every 8 weeks
  + Goal- 400 mgrs to course, 80 to monitor her egg production, 60 reduce deworming of non shedders. Horse people have trouble with the fecal egg cutoff numbers (300/g), want to deworm if they see any eggs
  + $144K grant over 3 years, most to pay coordinator
  + Parasites effect on manure quality- concerns about ivermectin in manure. Very minute amount, 92% dissipates as soon as it goes through horse. 120 degrees will kill strongyle eggs in compost.
  + Treat pastures with pepsin enzyme to kill encysted larvae? Sukhdeo research

Laura Kenny, Carey Williams, Mike Westendorf- Rutgers University

* Rotational Vs Continuous Grazing
  + 2 replicates of each, 3.5 acres each
  + Horse condition, vegetation, soil
  + 8 months of data presented at ESS, covered winter time
* Sugar Study
  + With Amy Burk and Bridgett McIntosh. Money from NJAES multistate
  + Hypothesize short continuous grasses will be higher in sugars than tall rotational
  + 24 hours blood (insulin and glucose), forage (sugar pack), fecal samples (ph)- not grab every 4 hours
  + On hay for 12 hours before start
  + June: Difference in fecal pH. Sugar and starch levels weren’t that difference.
  + Bridgett saw higher sugars in rotational, more simple sugars in leaf
  + C sequestration difference?
* Nutrient Management Planning and Optimizing the use of BMPs
  + Nutrient balance- inputs and outputs
  + CNMP (required for NRCS funding) vs AWMP (state mandated). CNMPs bring in some $
    - NRCS came to RU and asked for help writing them
    - CNMP very comprehensive
  + Issues we see: manure storages, sacrifice areas, pasture management, stocking density
  + Farms can compost manure and sell it if they do it right
  + Neighbors right on top of horse farms
  + What is most critical? For what purpose- grant writing vs environmental impact
  + What is cost-effective?
  + How do we encourage equine farms to buy in to BMPs? Tie to it horse health.
    - Heavy use pads are expensive, what alternatives? Geotextile expensive. 6” stone dust expensive. Crushed gravel drains better. Find funding to compare?
    - Use rubber mats as impervious manure storage

**Update on Review Papers**- Becky Bott

* Pasture paper done
* Submitted 2 nitrogen reviews- one was too large, split into nitrogen metabolism in horse and implications of N from horse manure on environment
  + JEVS interested in accepting
  + Provisional acceptance on environment paper. Betsy has a list of comments to discuss
  + Still waiting to hear from reviewers on metabolism paper

**State Reports**

South Dakota State University- Becky Bott

* Surveys to horse owners in SD

University of Florida- Carissa Wickens

* Air quality in equine facilities
  + Test emissions levels in mid-Atlantic too. Different bedding types.
  + 3 different dietary protein levels- 100, 150, 200% NRC requirement and effect on ammonia emissions. Higher ammonia on straw compared to shavings

University of MD- Amy Burk

* Got breeding program going
* New graduate student- develop diet horse pasture for laminitis prone horses
  + Not all horses can go out on the lush pastures that we promote
  + Laminitic horses put on dry lots, prone to erosion, limited exercise, hay $$
  + Low-yield, moderate to low palatability, get horses out and moving more
  + Looking at warm and cool season grasses
  + Online surveys- characterizing issues with managing obese horses
  + Field studies- 6 warm and 8 cool season grasses, testing wear tolerance and palatability. Same plots at VT Middleburg- will do palatability trials
  + Turf grasses in heavy use areas
  + Submitted CIG grant
  + Still have rotational grazing site, seminars
  + Industry- started recognition program, has 110 farms and 26 are horse farms

August 18

In Attendance: Ann Swinker (Penn State), Krishona Martinson (UMN), Mike Westendorf (Rutgers), Bridgett McIntosh (VT), Betsy Greene (UVM), Masoud Hashemi (UMass), Carey Williams (Rutgers), Laura Kenny (Rutgers), Paul Siciliano (NCSU), Alexandria Garcia (Maine grad student), Robert Causey (Maine), Cassie ??? (UMass), Shannon Phillips (NCSU), Jennifer Gill (NCSU grad student), Morgan ??? (NCSU grad student)

On call: Amy Burk (UMD), Becky Bott (SDSU), Jessie Weir (UFL Carissa’s grad student)

Agenda: Continue state reports, future planning

Betsy: next year’s meeting

* Amy Burk will host in Maryland, needs to join group
* Dates- August 15-16
* Will have pasture meeting on Saturday and have group members come up early to be speakers
* 2017 Maine or Arizona (winter date)

Mike: new grant ideas

* CIG or SARE grants? NJ has done state CIGs
* Carey- Warm season grass work
* Ann- Stick with soil health. Healthy soil is new buzz word.
* Mike- pull in carbon
* Bridgett- native warm season grasses for soil health and carbon sequestration. Nobody’s done it with horses Pat Kaiser at TN done it with cattle. Wildlife
* Ann- challenging to get farmers to plow up established fields
* CIG come out at Christmas, pre-proposal due Feb 1
* Carey- successful with state, not national. Maybe say “small farm” instead of “horse”
* Let’s do pre-proposal at minimum. National CIG (full) deadline was April 30, Bridgett and Amy applied for turf grass work.
* Ann- could do SARE beginning farmer one
* Warm season- use different grasses and expand to other species too, cattle, sheep, goats
  + CIG needs research and outreach component
  + Can we use public lands? Need to use EQIP eligible farms and some farmers won’t sign up with them
  + Bridgett will take lead, Carey, Krishona, Ann, Amy
  + Paul- multi species grazing for NSC content, have something else graze it first, also ameliorates parasite problem
  + Bridgett has sheep and cattle, can add horses
* Mike- cost effective BMPs on farms, especially water quality
  + State DEP just gave funding to implement low cost BMPs on farms.
  + Will follow up
* Ann- Fenceless rotational grazing
  + Spread cattle manure on areas that horses have already grazed, they won’t graze there
  + Can’t be composted
  + Fresher manure, longer they will stay off
  + By the time it works in, the grass has grown back
  + Ann does it on her farm

Other papers

* Manure storage paper
  + Paper about manure storage technologies, what’s available, microbio about water quality
  + Nice section in original NE1041 lit review on water quality

State Report

Bridgett McIntosh, Virginia Tech

* MARE Center Middleburg Ag and Research Center, dedicated to equine research but has some cattle and sheep too, joined Claremont Farm which does mixed species grazing
* Extension programs:
  + VA Horse Festival- new horse owner certification series. Free, had 70-80 people
  + Spotlight on Stewardship Equine Land Management Symposium- partnered with National Sporting Library Museum. Horse owners don’t know what Extension/MARE Center is. Museum helped advertise. 3-4 hours of lecture in morning, then hands on workshops in afternoon. Forage ID, soil pit (John G???). Followed with wine tasting at winery across the street, Library had event after. Charged $150, 36 paid registrants. Reduced fee if member of Library- lost some money. Big farm owners sent their workers instead of coming, need to hold “gala” to get owners to come, solicit donations.
  + VA Forage and Grassland Council- equine forage conferences, free program through grant
  + On-farm calls equine pasture management and conservation practices. Very time consuming, how to sustain? Krishona had same problem, implemented program for fee. Carey- send pictures via email or phone. Money less of an issue with these farm owners.
  + Conservation BMP Model Farm, continuous vs rotational grazing, modeled after MD, RU, TN. 8 acres, 4 horses, OTTB. Monthly sampling forage qual, plant biodiversity, animal weights and measures. Manure composting for dry lot manure. Native warm season grasses filter pollutants better than tall fescue for filtration strip. Sprigged Bermudagrass project with NRCS, crabgrass took over. Undergraduate training program, helped develop grazing system. Couldn’t get rid of crabgrass to allow Bermuda to grow, mob grazed with sheep and they ate it to nothing.
  + Novel turfgrass grazing systems- high yielding grasses to form dense mat, prevent soil erosion, diet paddocks for horse health. Sprayed roundup, tilled, planted. 6 varieties, cafeteria style. Grazed by pairs of 2 horses for 8 hr intervals. Persistence, tolerance to grazing, horse preference, nutrient quality. Establishing 2 acclimation grazing areas planted with each of 6 warm season varieties, and one with cool season varieties.
  + Biodiversity study- how grasslands affect birds, pollinator, plant species diversity. Field left to grow. Rare endangered birds found.
  + Teaching and Experiential Learning- summer interns, used to be breeding, now more pasture management

Masoud Hashemi, University of Massachussetts

* Funding from Mass DEP, select BMPs at 2 equine facilities- UMass farm, BlueStar Equiculture draft horse rescue
* Equiculture had no pastures at first, fed hay on ground, 42 draft horses and no vegetation. Wetlands, stream going through middle of property (Three Rivers). Horses had direct access, had 1 culvert. Manure stored near woods and never removed, leachate and runoff water into river 100 ft away
  + Pasture Paradise- opportunity for horse exercise. Turned center section into pasture, fenced off ring around it ~25 ft wide with feeding stations and water. Horses got along, partitioned pasture and allowed SOME horses to graze. Krishona- any research on this? Ann- difference between geriatric and athletic horse needs. Cassie wants to track activity. Good for geriatric horses, pecking order can be a problem. Manure not cleaned out of the track- occasionally, facility run by volunteers. Videos on website.
  + Turned ugly area into sacrifice area, installed gutters, scraped 6” of high organic matter, gravel, geotextile, 4” woodchips. Collapsed, didn’t work, had to remove wood chips and used compacted gravel instead. Wood chips no good for wet areas.
  + Compost bins, aerated. Demonstration. Tried trash bins too, pump air in. Windrows with perforated PVC pipe underneath, use blower and cover with semipermeable cloth. 2.5-3 months to compost, 1 month for curing.
* Hadley Horse Farm- lots of standing water, turns into ice sheets. Scraped, sand, drainage pipe, connect to swale. Fence horses out of stream. Sacrifice lots- drainage inside paddocks too. Different footing materials. Tried 3 materials with and without geotextile. Crushed gravel + textile, most expensive for 2400 sq ft at $3500. Raised bed boxes with different forage/legume species for demonstration- good scavenger hunt for students.
* Next- facility on Manchaug Lake, 40 horses, pile manure on top of hill over lake. Collect manure twice a year if he can access manure- muddy. Lots of leachate, running and standing water.

Jennifer Gill, North Carolina State University

* Effect of Body Condition of Daily Distance Traveled, Metabolic Response, and Energy Intake in Horses
* Energy intake(fecal collection harness) vs energy expenditure (Polar heart rate/GPS monitors)
* 8 horses, 12 days, paired by opposing BCS, grouped, two 72h collection rounds. 6 d total data per horse.
* Some differences between paired horses and rounds. Temperature played a role
* GPS tracking images

Alexandria Garcia, University of Maine

* A Sustainable Approach to the Control of Parasites, fate of streptococci in equine compost
* Strangles, transmitted horse to horse or humans to horses, high mortality and morbidity rates
* Zooepidemicus “parent of S. equi” can also infect humans and domestic animals
* Compost used for pathogen deactivation 155-160 deg
* S. equi and S. zoo die at 60 deg C
* Static piles, assess viability at various depths, 3 diff C:N ratios
* S. zoo, nothing after 14 days. S. equi nothing after 336 hours
* Sterilized compost and the bacteria lived 50 hours, also tried different moisture levels. Strep persisted better in dry manure than moist manure.
* Already present bacteria outcompeted the added S. equi and S. zoo

Robert Causey, University of Maine

* Remediation of Antibiotics and Antibiotic Resistant Bacteria in Compost used on Small Farms
* Grant with RU (Carey), UDel (Amy Biddle)
* Effect of sulfadiazine-trimethoprim on microbial communities in equine compost
* 3 compost piles- horses on AB, waste with AB applied exogenously, waste with no AB
* Soil microbiologist- single source C substrate utilization, 16S rRNA gene sequencing
* Seed grant- submitted in May
* Ann- need to look at Bute and Banamine too

Betsy Greene, University of Vermont

* Fall Workshop, VT passed legislation for water quality, improve Lake Champlain. 2 farms, very different audiences. Across the Fence episode
* Betsy hopefully heading to U of Arizona
* Incorporate 4-H, youth into stewardship programs

Paul Siciliano, North Carolina State University

* Sward Height and NSC content, blood glucose/insulin response
  + 3 grass heights, NSC content goes up with height. Shorter heights were always in state of regrowth, using sugars, plus fewer leaves. Fall tall fescue, good weather. No seed heads on tall grass, mowed so it doesn’t send up repro tiller.
  + Grazing plots with each height. Horses went to taller grass, out for 1 hour.
  + Crossover design, 4 grazing cells short and long grass. Sampling on day 7 every 2 hours for 8 hrs.
  + Short = 6-7 inches, long 15-16-17 inches
  + Less herbage mass in short
  + NSC lower in short
  + Insulin decreased, some horses more than others. Mean insulin increased hour 2-4 in long grass
  + Multi species “leader-follower” systems could benefit horses by taking grass height down. Cattle graze first, then horses
* Effect of grazing cell size on pasture utilization characteristics
  + 2 large cells, 2 same size but divided in 3. 2 horses, 21 days. Uniformity of grazing
  + Herbage mass, sward height no diff between trt. Lower after grazing.
  + Ground cover very good in both, lots of residue
  + Compressed sward height (plate meter- plexiglass disc, height + density) areas grazed too heavily. Trend for multiple small cells to have more of those areas. Less spot grazing in large cell.
* Internet video on grazing management
  + Intro to prescribed grazing, balancing intake with requirements
  + Video chronicle, integration of practices, observation of outcomes on cooperating farm.
  + 12 or so short videos

Future Plans

New paper- Pasture Research Estimation Techniques

* Krishona is on lead, assigned sections. Will do monthly conference calls, hope to submit by end of year. Laura’s methods paper needs to be submitted so it can be referenced.

Reviewer comments on nitrogen paper

* Discussion on a few comments