

N Fixation Correction for “Other Haylage”

September 19, 2019

The approved nitrogen fixation rate for “other haylage; grass silage and greenchop” is inadvertently high

- **Issue:** An incorrect, and high, value for the crop “other haylage; grass silage and greenchop” was inadvertently put in the list of values to be approved by the AMS and AgWG. The values were approved without anyone noticing the error.
- **Action:** On Sept 19th, the AgWG will consider for approval a new value to be used in CAST for all scenarios.
- **Effect:** This crop type was first seen late in the 2002 Ag Census. The high value of fixation is creating high nitrogen loads relative to earlier periods without this crop. The new fixation rate will reduce total delivered N loads by approximately 0.7 million pounds in the 2018 progress run
- **Rationale:** This crop type had zero acres in 1995 so there would be no change to the loads during the TMDL critical period. The update is a more accurate representation.

From CAST

CropName	LoadSource
alfalfa hay	Leguminous Hay
alfalfa seed	Leguminous Hay
birdsfoot trefoil seed	Leguminous Hay
haylage or greenchop from alfalfa or alfalfa mixtures	Leguminous Hay
red clover seed	Leguminous Hay
vetch seed	Leguminous Hay
bromegrass seed	Other Hay
cropland on which all crops failed or were abandoned	Other Hay
fescue seed	Other Hay
orchardgrass seed	Other Hay
other field and grass seed crops	Other Hay
other haylage; grass silage and greenchop	Other Hay
other managed hay	Other Hay
ryegrass seed	Other Hay
small grain hay	Other Hay
timothy seed	Other Hay

CAST definition: Hay crops that include species that fix nitrogen such as alfalfa, vetch and clover.

CAST definition: Hay crops that exclude species that fix nitrogen such as alfalfa and clover. Includes haylage, grass seed, and failed crops.

Ag Census Definition: Includes all types of mixtures excluding alfalfa that were harvested as haylage or greenchop (green weight). All other area harvested as dry hay is not included]

From CAST

CropName	LoadSource
alfalfa hay	Double Cropped Land
barley for grain	Double Cropped Land
corn for silage or greenchop	Double Cropped Land
other haylage; grass silage and greenchop	Double Cropped Land
rye for grain	Double Cropped Land
small grain hay	Double Cropped Land
sorghum for grain	Double Cropped Land
soybeans for beans	Double Cropped Land
triticale	Double Cropped Land
w heat for grain	Double Cropped Land

CAST definition: Double-cropped land represents areas that have two crops grown on the same acre between January and December. Crops eligible for double-cropping vary by state and may include alfalfa, barley, rye, small grain hay, sorghum for silage, soybeans, triticale, wheat, corn for silage or greenchop, and other haylage, grass silage, and greenchop. No other land use includes double cropping.

Ag Census Definition: Includes all types of mixtures excluding alfalfa that were harvested as haylage or greenchop (green weight). All other area harvested as dry hay is not included]


Rationale

- “other haylage” is predominantly non-leguminous, therefore is best nested under “Other Hay”
- non-alfalfa mixes tend towards mostly or all grass *on beef operations and in the northern part of the watershed*
- non-alfalfa mixes tend towards mostly or all grass *in the northern reaches of the watershed*
- *Mixes will vary greatly throughout the watershed*

Weighted Average (Proposed Fixation Rate Change: *Other haylage*)

Crop	Fixation lbs/ac	Weighting Factor	Fix x Weight	
Non-leg. (grasses)	0	0.7	0	
Non-leg. /leg. Mix*	151.18	0.2	30.24	
Mixed hay (mostly grass)**	30.24	0.1	3.02	
Other Haylage			33.26	Weighted Average
*haylage or greenchop from alfalfa or alfalfa mixtures (proxy for other N-fixing species)				
**cropland used only for pasture or grazing				

Proposed **revised**
fixation rate for
“other haylage;
grass silage and
greenchop”



Current N fixation rates in Phase 6 model

Crop Name	N Fixed Per Yield Unit	Yield Unit
haylage or greenchop from alfalfa or alfalfa mixtures	151.18	acres
other haylage; grass silage and greenchop	175.73	acres
pastureland and rangeland other than cropland and woodland pastured	30.24	acres

State	Other Hay & Dbl Crop Acres	Avg Other Hay/Dbl Crop N load per acre OLD (lbs)*	Avg Other Hay/Dbl Crop N load per acre NEW (lbs) ESTIMATED**	Change in Avg Other Hay/Dbl Crop N load (million lbs) ESTIMATED**	% Total N load reduction ESTIMATED**
DE	46789.53	18.69	18.66	0.00	-0.13
MD	338062.28	18.41	18.19	-0.06	-0.98
PA	712325.15	21.37	20.72	-0.35	-2.62
NY	290123.94	10.24	6.19	-0.16	-5.91
VA	644809.88	16.20	15.96	-0.07	-0.78
WV	122809.42	18.29	17.30	-0.03	-1.96
TOTAL	2154920.20			-0.68	

* Includes *stream bed and bank* load source/land use N loads distributed equally among total *other hay* and *double crop* load source/land use acres and calculated with a 175.73 lbs N fixation per acre value for “other haylage; grass silage and greenchop.”

** Estimated values based 30 lbs N fixation per acre value for “other haylage; grass silage and greenchop.” **NOT FINAL.**