

**NEBRASKA TECHNICAL NOTE**  
U.S. Department of Agriculture  
Natural Resources Conservation Service

June 12, 2013

Range and Pasture Technical Note No. 24  
Doug Whisenhunt  
State Rx Burn Specialist

The attached Range and Pasture Technical Note is intended to provide guidance to Field Office employees on the effects of Rx fire on a variety of shrubs, forbs and grasses. This note should be used to determine the effectiveness of Rx fire as a management tool in specific situations, and the potential damage to non-target species as well as the effectiveness on the species to be controlled.



July forb/grass response to a 1,200 acre March erc control burn in southern Lincoln County

# Fire Effects on Selected Shrubs, Forbs and Grasses

Nebraska Range and Pasture Technical Note NE-24



## Rx Fire as a Tool for Vegetation Management

RX Fire can be used as a vegetation management tool in a variety of landscapes to achieve a wide range of conservation goals. Fire is a complex natural phenomenon that shapes landscapes on a global scale. By harnessing this force, we are able to positively impact the vegetative communities in which we work. A carefully planned and safely executed Rx burn can achieve invasive species control, rejuvenate native grasses and stimulate the growth of native forbs.



Extremely successful erc control on a 750 acre 2009 Canyon burn



High erc mortality on 15 to 20' trees on a 960 acre 2008 spring burn

The following tables are categorized by vegetation type and describe the effects of fire on the selected species featured in each category.

Woody Plants Known Response to Fire

Table 1: Key

**Response to Season of Burn**

ES- Early Spring; LS- Late Spring; S-Summer; F-Fall; W-Winter

- Increase stem density/biomass 1
- Stimulates sprouting** 2
- Response varied/no response 3
- No data 4
- Causes plant mortality 5
- Reduce biomass, height 6
- Stimulates Flowering/seed 7

**Frequency**

- E-eliminates
- R-reduces above ground biomass
- M-maintains-Biomass remains about the same
- I- increases biomass
- V-Variable- response varies, data not conclusive
- U- Unknown- no data

**Tolerance**

Topkill-kills the above ground portion of the plant

- Yes Y
- No N
- No Data U
- Vigorous resprout A
- Moderate resprout B
- Weak/no resprout C
- Colonizes from seed D

Woodies	Tolerance	Response to Frequency/ Season of Burn						
		Annual	Periodic	ES	LS	S	F	W
American Plum	Y,A,D	M	I	1,2,6	1,2,6	4	4	4
Buckbrush/snowberry (Symphoricarpos)	Y,A	R	V	3	1,2,6	1	3	4
Cottonwood (young trees)	Y,C	E	E	5	5	5	5	4
Redosier Dogwood	Y,A,D	V	I	3	3	4	3	4
False Indigo (A. fruticosa L.)	Y,A	R	R	4	4	4	4	4
Black Locust	Y,A	M	I	2	2	2	2	4
Honey Locust	Y,C	E	V	3	3	4	3	4
Lead Plant	Y,A	I	I	1,2,6,7	1,2,6,7	6	1,2,6,7	4
Osage Orange	Y,B	V	V	4	4	4	4	4
Prickly-pear cactus	Y,B,D	R	R	6	6	5,6	6	4
Eastern red cedar	Y,C,D	E	E	5,6	5,6	5,6	5,6	5,6
Rocky Mtn Juniper	Y,C,D	E	E	5,6	5,6	5,6	5,6	5,6
Russian olive	Y,A	I	I	1,2	1,2	1,2	1,2	4
Sageworts	Y,B	V	V	3	3	3	3	3
Salt cedar	Y,A	I	I	1,2	1,2	5,6,7	1,2	4
Sand sagebrush	Y,A	U	U	2,6	2,6	4	2,6	4
Siberian Elm	Y,C,D	R	R	4	4	4	4	4
Soapweed (yucca)	Y,B,D	R	R	2,6	2,6	4	4	4
Smooth sumac	Y,A,D	I	I	1,2	1,2,6	1,2	1,2	4

Willows	Y,B,D	R	R	4	4	4	4	4

No Data E

**Forbs Known Response to Fire**

Table 2: Key

**Response to Season of Burn**

ES- Early Spring; LS- Late Spring; S-Summer; F-Fall; W-Winter

- Increase stem density/biomass 1
- Stimulates sprouting** 2
- Response varied/no response 3
- No data 4
- Causes plant mortality 5
- Reduce biomass, height 6
- Stimulates Flowering/seed 7

**Frequency**

- E-eliminates
- R-reduces above ground biomass
- M-maintains-Biomass remains about the same
- I- increases biomass
- V-Variable- response varies, data not conclusive
- U- Unknown- no data

**Tolerance**

- Topkill-kills the above ground portion of the plant
- Yes Y
- No N
- No Data U
- Vigorous resprout A

Forbs	Tolerance	Response to Frequency/ Season of Burn						
		Annual	Periodic	ES	LS	S	F	W
Common mullein	Y,D	M,I	M,I	1,5	1,5	1,5	1,5	1
Dotted gayfeather	Y,B,D	V	I	1	3	6	6	4
Hemp	Y,A,D	V	V	3	3	3	3	3
Leafy spurge	Y,A,D	I,M	I,M	1,2	1,2	3	3	3
Purple loosestrife	N,A	U	U	4	4	4	4	4
Purple (white) prairie	Y,A,D	R	I	1,2	6	4	1	3

- Moderate resprout B
- Weak/no resprout C
- Colonizes from seed D
- No Data E

clover				7				
Sericea lespedeza	Y,B,D	I	I	1,2	1,2	4	5,6	4
Upright coneflower	Y,B,D	R	V	4	4	4	4	4
Western ironweed	Y,E	U	U	4	4	4	4	4
Western Ragweed	Y,B,D	I(fall) R(sprng)	I	1,2	6	4	1	1
Western water hemlock	U,E	U	U	4	4	4	4	4



Native warm season grasses and forbs flourish under erc killed by Rx fire

Table 3: Key

**Response to Season of Burn**

ES- Early Spring; LS- Late Spring; S-Summer; F-Fall; W-Winter

- Increase stem density/biomass 1
- Stimulates sprouting 2**
- Response varied/no response 3
- No data 4
- Causes plant mortality 5
- Reduce biomass, height 6
- Stimulates Flowering/seed 7

**Frequency**

E-eliminates

R-reduces above ground biomass

M-maintains-Biomass remains about the same

I- increases biomass

V-Variable- response varies, data not conclusive

U- Unknown-no data

**Tolerance**

Topkill-kills the above ground portion of the plant

- Yes Y
- No N
- No Data U
- Vigorous resprout A
- Moderate resprout B
- Weak/no resprout C
- Colonizes from seed D
- No Data E

Grasses	Tolerance	Response to Frequency/ Season of Burn						
		Annual	Periodic	ES	LS	S	F	W
Caucasian bluestem	Y,A	I	I	3	1,2	4	4	4
Cheatgrass	Y,C,D	I	V	5,6	1	1	3	3
Silver beardgrass (bluestem)	Y,I	I	I	3	1,2	4	4	4
Smooth brome	Y,B	V	V	1,2	5,6	5,6	1	3
Tall dropseed	Y,B	V	M	1	5,6	5,6	3	3
Tall fescue	Y,B	U	U	6	6	7	3	1



Aerial shot of a 2009 canyon burn for erc control



Big Bluestem and sunflowers replace cedar duff under a mot of erc controlled by Rx fire

Table 1: Key

**Response to Season of Burn**

ES- Early Spring; LS- Late Spring; S-Summer; F-Fall; W-Winter

- Increase stem density 1
- Stimulates sprouting 2
- Response varied 3
- No conclusive data 4
- Causes plant mortality 5
- Reduce biomass, height 6
- Stimulates Flowering 7

**Frequency**

- E-eliminates
- R-reduces above ground biomass
- M-maintains-Biomass remains about the same
- I- increases biomass
- V-Variable- response varies, data not conclusive
- U-No data

**Tolerance**

- Topkill-kills the above ground portion of the plant
- Yes Y
- No N
- No Data U
- Vigorous resprout A
- Moderate resprout B
- Weak/no resprout C
- Colonizes from seed D
- No Data E

Thistles	Tolerance	Response to Frequency/ Season of Burn						
		Annual	Periodic	ES	LS	S	F	W
Bull, Common	Y,C,D	U	U	4	4	4	4	4
Canada	Y,B,D	R	R	4	4	4	4	4
Field, Sow	Y,B,D	U	U	4	4	7	4	4
Flodman	Y,B,D	U	U	4	4	4	4	4
Musk	Y,B,D	R	R	4	4	4	4	4
Platte	Y,B,D	R	R	4	4	4	4	4
Plumeless	Y,B,D	R	R	4	4	4	4	4
Russian	Y,C	I	I	4	4	4	4	4
Scotch	Y,B,D	U	U	4	4	4	4	4
Wavy leaf	Y,B,D	U	U	4	4	4	4	4
Yellow spine	Y,B,D	U	U	4	4	4	4	4

While little statistically valid research was found on many of the thistle species, most authors theorized that based on ocular observation, few species were actually killed by fire, and most re-sprouted from basal or underground remnants to some degree.



Midgrass warm season prairie response to 900+ acre late April burn for erc control

It needs to be remembered that a number of variables impact the effects of fire on all plant species, and the information in the tables reflects trends based on research and observations of fire practitioners around the country. The effects experienced locally will depend on the conditions and variables that occurs specific to each burn.

*Helping People Help the Land an Equal Opportunity Employer and Provider*