TECHNICAL NOTE

USDA-Natural Resources Conservation Service
Boise, Idaho - Salt Lake City, Utah

TN PLANT MATERIALS NO. 17 **OCTOBER 2011**

FIELD AND DEMONSTRATION PLANTINGS

Derek J. Tilley, Agronomist, PMC, Aberdeen, Idaho
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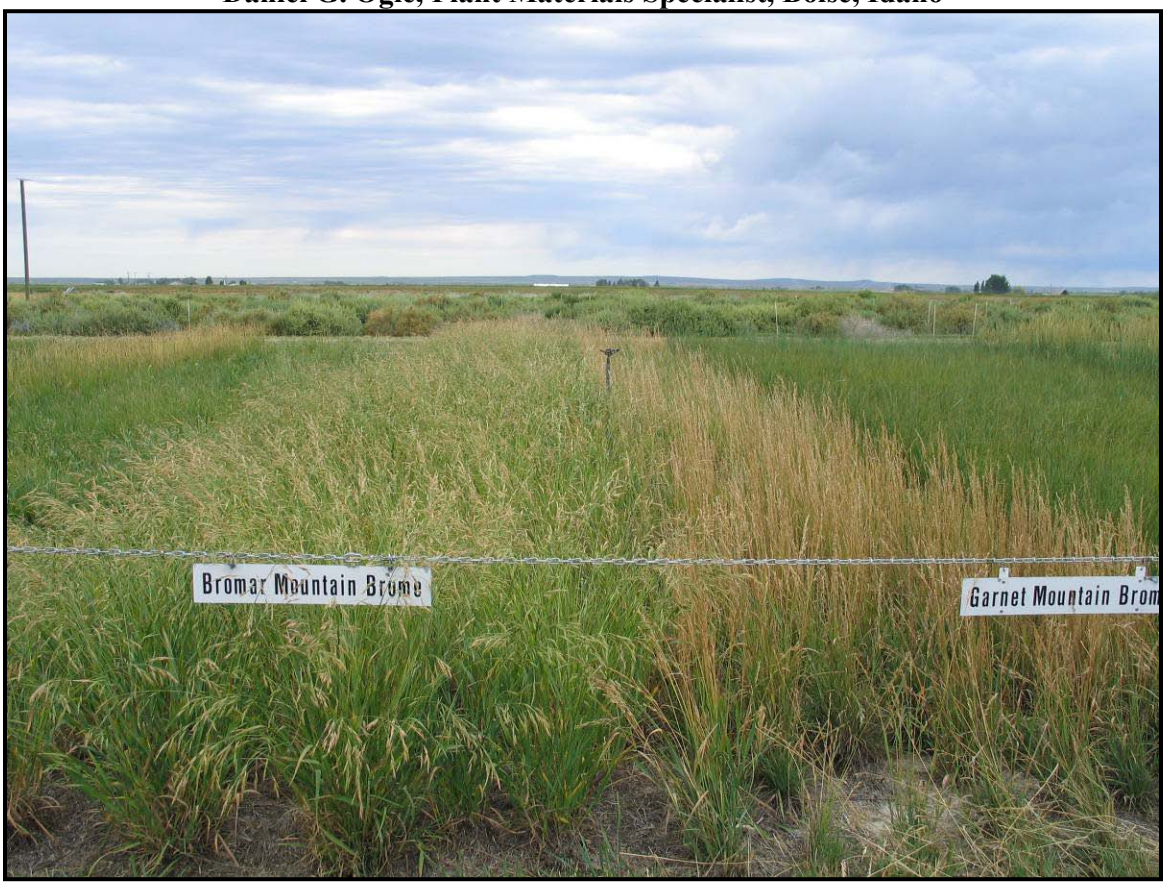

Aberdeen, Idaho PMC Grass Display Nursery demonstrating differences in phenology and morphology of 'Bromar' and 'Garnet' mountain brome (Bromus marginatus). Photo by Dan Ogle, NRCS, Idaho

FIELD AND DEMONSTRATION PLANTINGS

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Introduction

Field plantings are non-replicated, small acreage plantings used by the Plant Materials Program (PM) to assess the conservation potential of new or developing plant materials and technology under actual field conditions. Field plantings are among the many tools used in the plant materials program to evaluate and promote plant materials and can serve a number of purposes.

First, field plantings are an excellent way to complete final evaluations of promising plant materials under real life (farmer installed with actual farm equipment) conditions. The plant materials program depends on landowner participation to field-test new selections of grasses, forbs, and woody plants and the best methods to get them established. This happens by working with local conservation districts and NRCS field offices that are routinely in contact with local farmers and ranchers who show interest in looking at new plants and technologies. This unique relationship allows the plant materials program to field-test new plant materials and establishment technologies in a "real world" setting on farms and ranches throughout the PMC service area and other promising locations. The results of field plantings provide information and confidence to conservation planners to recommend these plant materials to address various conservation needs.

Field Planting of Aberdeen PMC Releases

Snake River Plains fourwing saltbush

Northern Cold Desert winterfat

Anatone bluebunch wheatgrass

Photo: Dan Ogle, Plant Materials Specialist, NRCS, Boise, Idaho; Near White Bird, Idaho

Second, field plantings can be utilized to further test and potentially promote released plant materials. This includes both new and older releases whose adaptation or utilization in addressing conservation concerns and landowner priorities may not be fully understood. This technique builds field staff confidence in well-adapted plant materials. Conservationists will more readily recommend plant materials they are familiar with over materials with which they have no experience.

Third, field plantings are a good means to evaluate the plant material's value to solve a specific resource problem or concern; for example, when it is uncertain what materials will work best to solve that specific problem or concern. This application is essentially a non-replicated Conservation Field Trial (CFT). These are used as a tool to evaluate new technologies, species or plant releases to address local soil and water resource problems. Data obtained in field plantings can further be used to expand information available in plant guides and technical note recommendations for specific practices.

Field offices should also consider the use of demonstration plot plantings. Demonstration plantings are composed of small plots of plants that are grown side by side for simple comparison of vigor, plant size and other growth characteristics. The species planted in these plots should be those typically used for conservation purposes within the general area of the demonstration planting. These simple demonstrations allow land owners and field staff to compare different species or different releases of the same species. Demonstration plots are also a useful place for field staff to show a land owner what a species looks like when it is being recommended.

Demonstration Turf Plot Planting, Ontario, OR. Photo: Dan Ogle, NRCS, Idaho

Field plantings should not be confused with other plant materials selection trials such as Initial Evaluation Plantings (IEPs), Advanced Evaluation Plantings (AEPs) and common garden

studies. These are replicated scientifically designed studies conducted under controlled settings in order to find and document differences between accessions of a species.

Field Planting Design and Development
Field plantings are not intended to be a scientific study. These plantings are almost never installed under replicated conditions. However, under most circumstances, they should be installed along side a standard of comparison (the species or plant materials currently utilized under similar conditions). The Plant Materials Specialist or Plant Materials Center staff can work with you to design a planting or suggest species appropriate to the site and landowner objectives.

The field planting process should be initiated either by the conservation district, field office staff or the land owner. Field offices are encouraged to suggest field plantings to cooperative land owners. The field office can then contact the plant materials center or plant materials specialist to determine if potential species and accessions are available and for assistance in developing a planting plan.

Because there is rarely much seed available for allocations, field planting seed requests are usually limited to enough seed to plant 0.25 to 5 acres, and the cooperator is asked to plant the remaining area to the standard of comparison. Demonstration plots are typically considerably smaller in scale and require a minimal amount of seed.

The form NRCS-ECS-09 (appendix) is required for developing plans for field plantings in cooperation with the land owner(s).

Obtaining Seed
To obtain seed for a field planting, seed can be requested from the Plant Materials Center(s) (PMCs) or Plant Materials Specialist (PMS). This is often done through the representative to the state Plant Materials Committee. If seed is available at the PMC(s), no cost is required for the field planting seed. If seed is not available through PMC(s), then seed may need to be purchased. This is most commonly done by working with the State Resource Conservationist or Assistant State Conservationist and using CTA funds to complete the purchase. Because this is a technology transfer – technology development program primarily between the Field Office and landowner, no PMC funds (funds intended for the operation of the PMC) should be expended. The standard of comparison seed is normally provided by the landowner. Remember to plan ahead - seed requests must be made well in advance of the desired planting.

Evaluation
The PMC and PMS would like to obtain as much information as possible regarding the planting in order to make the data obtained accessible to a broad audience. Typically field plantings are evaluated for percent germination, survival of planted material and other general growth measurements. Evaluations are commonly conducted annually for the first three to five years of the planting and then only every 3- 5 years thereafter. Once all information considered of value to the Field Office, PMC or PMS has been obtained, then the planting is commonly cancelled and no longer evaluated.

A Planting and Site Information form ID-ECS-01 (appendix) should be completed at the time of installation. This will provide basic site information and installation/management practices that can be useful in developing progress reports, plant guides, technical notes and other documents.

Several forms are available for the evaluation of different types of field plantings.

ID-ECS-02 Evaluation of Herbaceous Species
ID-ECS-03 Evaluation of Woody Species
ID-ECS-04 Evaluation of Demonstration/Plot Plantings
ID-ECS-05 Evaluation of Seed Increase Plantings

These forms are usually filled out by the field office staff and the landowner. Not all data is required, but the more information that is provided, the more valuable the results will be for future reference. Certain items on the evaluation sheet may not apply to all plantings. The forms are intended as a guide and can be modified or supplemented as necessary.

Field planting evaluations (copies) should be submitted to the PMC or PMS. Evaluations will then be used to develop summaries of this information which will be presented at Plant Materials Committee Meetings, Field Offices and other interested parties.

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

NRCS-ECS-9
September 2009

PLANTING PLAN FOR FIELD, SPECIAL AND INCREASE PLANTINGS

Planting No. _____ **Field Office** _____

Cooperator _____ **Phone Number** _____

Address _____

State _____ **County** _____ **MLRA** _____

Township _____ **Range** _____ **Section** _____

Latitude _____ **Longitude** _____ **Location Map Provided** ☐ **Yes**

Soil _____ **Texture** _____ **Soil Modifier** _____

Slope % _____ **Aspect** ☐**N** ☐**S** ☐**E** ☐**W** **Elevation** ☐**ft or** ☐**m** _____

Annual Precipitation ☐ **in or** ☐**mm** _____ **Irrigation Available** ☐ **Yes** ☐ **No**

Number of Acres to be Planted/Seeded _____

	Scientific Name or Common Name	Cultivar/Release Name	Accession Number	Seeding / Planting Rate	Amount Needed	Supplied By
1						
2						
3						
4						
5						

Site History Previous Three Years

20___ _____

20___ _____

20___ _____

Purpose of Planting

Proposed Planting Date or Period _____

Method of Planting to be Used

Materials Needed	Rate/Acre	Notes
Lime		
Fertilizer		
Herbicide		
Mulch		
Material 1		
Material 2		

Print Form Clear Form

PLANTING PLAN FOR FIELD, SPECIAL AND INCREASE PLANTINGS (CONTINUED)

To Be Completed By The Assisting Conservationist

Does the cooperator understand the purpose of planting?	**Yes** ☐	**No** ☐
Does the cooperator understand the cultural practices needed?	**Yes** ☐	**No** ☐
Does the site meet the requirements in the planting guide?	**Yes** ☐	**No** ☐
Is it conveniently located?	**Yes** ☐	**No** ☐
Is it on the soil identified in the plan?	**Yes** ☐	**No** ☐
Will the planting be grazed?	**Yes** ☐	**No** ☐
When?	_____	
Has the cooperator agreed to properly manage the planting?	**Yes** ☐	**No** ☐
Are weed control measures needed?	**Yes** ☐	**No** ☐
Will weeds be managed?	**Yes** ☐	**No** ☐
Will field and equipment be checked prior to planting?	**Yes** ☐	**No** ☐
Does the cooperator need assistance with planting?	**Yes** ☐	**No** ☐
Will NRCS personnel assist with planting?	**Yes** ☐	**No** ☐
Will follow-up assistance be provided?	**Yes** ☐	**No** ☐
To periodically check on the planting?	**Yes** ☐	**No** ☐
To complete required evaluations?	**Yes** ☐	**No** ☐

Location map for the planting must be provided/attached.

Evaluations to be conducted

Comments

I understand that this planting is for research and demonstration purposes and agree to participate in the establishment, maintenance and evaluation of this planting.

Cooperator:	**Name/Signature**		**Date**_____
Submitted By:	**Name/Signature**		**Date**_____
Approved (SCD):	**Name/Signature**		**Date**_____
Approved (PM):	**Name/Signature**		**Date**_____

Print Form Clear Form

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ID-ECS-01
2011

PLANT MATERIALS – PLANTING AND SITE INFORMATION (as installed)

COOPERATOR _____ PLANTING NO. _____

CULTIVAR/ACC.NO. 1. _____ 2. _____ 3. _____

4. _____ 5. _____ 6. _____

FIELD OFFICE _____ PURPOSE _____

PLANTING DATE _____ EVALUATOR _____

SOIL _____ SOIL pH _____ SOIL LIMITATIONS _____

SLOPE / ASPECT _____ / _____ RAINFALL ZONE _____ ELEVATION _____

INSTRUCTIONS; EACH COLUMN REPRESENTS A DIFFERENT SPECIES

WRITE IN THE APPROPRIATE DATA

WRITE IN SPECIES AT TOP OF COLUMNS:											
SEEDBED PREPARATION	TILLAGE										
	PACKING										
	OTHER										
CONDITION OF SEEDBED	excellent, good fair, poor	1		2		3		4		5	6
KIND OF MATERIAL	seed, sod, clone, cutting, graft, sprig, layering	1		2		3		4		5	6
PLANTING METHOD	SEED	DRILL - SPACING					RATE PER ACRE				
		AERIAL - BROADCAST					RATE PER ACRE				
	TREE/ SHRUB	HAND PLANT					TREE PLANTER				
SOIL MOISTURE	good, adequate, too dry, too wet	1		2		3		4		5	6
WEED INFESTATION	none, light, moderate, severe	1		2		3		4		5	6

IRRIGATION KIND _____ FULL-SEASON LIMITED-SEASON

HERBICIDE KIND: LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, NITROGEN LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, PHOSPHORUS LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, POTASSIUM LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, OTHER _____ LBS/ACRE _____ DATE APPLIED _____

COMMENTS:

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ID-ECS-02
2011

PLANT MATERIALS – EVALUATION OF HERBACEOUS PLANTINGS

COOPERATOR _____ PLANTING NO. _____

CULTIVAR/ACC.NO. 1. _____ 2. _____ 3. _____

4. _____ 5. _____ 6. _____

FIELD OFFICE _____ PURPOSE _____

EVALUATION DATE _____ EVALUATOR _____

AVE. ANNUAL PPT _____ (CIRCLE) FAVORABLE AVERAGE UNFAVORABLE

INSTRUCTIONS; EACH COLUMN REPRESENTS A DIFFERENT SPECIES

WRITE IN THE APPROPRIATE DATA - NUMBER FROM BELOW OR ANSWER

1 - EXCELLENT 3 - GOOD 5 - FAIR 7 - POOR 9 – VERY POOR 0 - NONE

WRITE IN SPECIES AT TOP OF COLUMNS:		1		2		3		4		5	6
STAND	SUCCESS	1		2		3		4		5	6
PLANTS/FT2	NUMBER	1		2		3		4		5	6
SURVIVAL	PERCENT	1		2		3		4		5	6
VIGOR		1		2		3		4		5	6
ABILITY TO SPREAD		1		2		3		4		5	6
EROSION CONTROL		1		2		3		4		5	6
FORAGE PRODUCTION		1		2		3		4		5	6
PRODUCT PRODUCED		HAY				SILAGE				PASTURE (AUMs)	
PLANT HEIGHT	INCHES	1		2		3		4		5	6
YIELD	TONs / ACRE	1		2		3		4		5	6
	AUMs/ACRE	1		2		3		4		5	6
UTILIZATION: none, light, moderate, severe		1		2		3		4		5	6
PLANT INJURY: none, light, moderate, severe KIND OF INJURY: disease, insect, rodent, hail, drought, grazing, flood, winter, fire, machine		1		2		3		4		5	6
WEED INFESTATION: none, light, moderate, severe		1		2		3		4		5	6
WILDLIFE USE v. high, high, moderate, low, none		1		2		3		4		5	6
SEED PRODUCED	YES / NO	1		2		3		4		5	6

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ID-ECS-02
2011

PLANT MATERIALS – EVALUATION OF HERBACEOUS PLANTINGS

DROUGHT TOLERANCE N/A 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____

FLOOD TOLERANCE N/A 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____

SALT TOLERANCE N/A 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____

ACID TOLERANCE N/A 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____

WATER TOLERANCE N/A 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____

STAND MANAGEMENT 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____

IRRIGATION KIND _____ FULL SEASON _____ LIMITED SEASON _____

FERTILIZER, NITROGEN LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, PHOSPHORUS LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, POTASSIUM LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, OTHER _____ LBS/ACRE _____ DATE APPLIED _____

COOPERATOR'S EVAL. N/A 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____

ADAPTED TO SITE YES / NO 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____

COMMENTS:

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ID-ECS-03
2011

PLANT MATERIALS – EVALUATION OF WOODY PLANTINGS

COOPERATOR _____ PLANTING NO. _____

CULTIVAR/ACC.NO. 1. _____ 2. _____ 3. _____

4. _____ 5. _____ 6. _____

FIELD OFFICE _____ PURPOSE _____

EVALUATION DATE _____ EVALUATOR _____

AVE. ANNUAL PPT _____ (CIRCLE) FAVORABLE AVERAGE UNFAVORABLE

INSTRUCTIONS: EACH COLUMN REPRESENTS A DIFFERENT SPECIES

WRITE IN THE APPROPRIATE DATA - NUMBER FROM BELOW OR ANSWER

1 - EXCELLENT 3 - GOOD 5 - FAIR 7 - POOR 9 – VERY POOR 0 - NONE

WRITE IN SPECIES AT TOP OF COLUMNS:													
SURVIVAL	PERCENT	1		2		3		4		5		6	
	NO. Alive / Planted	1	/	2	/	3	/	4	/	5	/	6	/
VIGOR		1		2		3		4		5		6	
ABILITY TO SPREAD		1		2		3		4		5		6	
PLANT HEIGHT	INCHES	1		2		3		4		5		6	
CROWN WIDTH	FEET	1		2		3		4		5		6	
Diameter @ Breast Height	DBH - INCHES	1		2		3		4		5		6	
PLANT UNIFORMITY		1		2		3		4		5		6	
BRANCHING PATTERN	DENSITY	Sparse <40%				Moderate 40-60%				Dense > 60%			
FRUIT PRODUCTION		1		2		3		4		5		6	
FRUIT MATURE	DATE	1		2		3		4		5		6	
PLANT INJURY: none, light, moderate, severe KIND OF INJURY:	disease, insect, rodent, hail, drought, grazing, flood, winter, fire, machine	1		2		3		4		5		6	
WEED INFESTATION:	none, light, moderate, severe	1		2		3		4		5		6	
WILDLIFE USE	v. high, high, moderate, low, none	1		2		3		4		5		6	
EROSION CONTROL		1		2		3		4		5		6	
DROUGHT TOLERANCE	N/A	1		2		3		4		5		6	

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ID-ECS-03
2011

PLANT MATERIALS – EVALUATION OF WOODY PLANTINGS

FLOOD TOLERANCE	N/A	1		2		3		4		5		6	
SALT TOLERANCE	N/A	1		2		3		4		5		6	
ACID TOLERANCE	N/A	1		2		3		4		5		6	
WATER TOLERANCE	N/A	1		2		3		4		5		6	
IRRIGATION KIND							FULL SEASON				LIMITED SEASON		
FERTILIZER, NITROGEN			LBS/ACRE						DATE APPLIED				
FERTILIZER, PHOSPHORUS			LBS/ACRE						DATE APPLIED				
FERTILIZER, POTASSIUM			LBS/ACRE						DATE APPLIED				
FERTILIZER, OTHER			LBS/ACRE						DATE APPLIED				
PESTICIDE, KIND			LBS/ACRE						DATE APPLIED				
COOPERATOR'S EVAL.	N/A	1		2		3		4		5		6	
ADAPTED TO SITE	YES / NO	1		2		3		4		5		6	

COMMENTS:

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ID-ECS-04
2011

PLANT MATERIALS – EVALUATION OF DEMONSTRATION/PLOT PLANTINGS

COOPERATOR _____ PLANTING NO. _____

CULTIVAR/ACC.NO. 1. _____ 2. _____ 3. _____

4. _____ 5. _____ 6. _____

FIELD OFFICE _____ PURPOSE _____

EVALUATION DATE _____ EVALUATOR _____

AVE. ANNUAL PPT _____ (CIRCLE) FAVORABLE AVERAGE UNFAVORABLE

INSTRUCTIONS; EACH COLUMN REPRESENTS A DIFFERENT SPECIES

WRITE IN THE APPROPRIATE DATA - NUMBER FROM BELOW OR ANSWER

1 - EXCELLENT 3 - GOOD 5 - FAIR 7 - POOR 9 – VERY POOR 0 - NONE

WRITE IN SPECIES AT TOP OF COLUMNS:

STAND	SUCCESS	1		2		3		4		5	6
PLANTS/FT2	NUMBER	1		2		3		4		5	6
SURVIVAL	PERCENT	1		2		3		4		5	6
VIGOR		1		2		3		4		5	6
ABILITY TO SPREAD		1		2		3		4		5	6
EROSION CONTROL		1		2		3		4		5	6
FORAGE PRODUCTION		1		2		3		4		5	6
PLANT HEIGHT	INCHES	1		2		3		4		5	6
YIELD	TONs / ACRE	1		2		3		4		5	6
	AUMs / ACRE	1		2		3		4		5	6
UTILIZATION: none, light, moderate, severe		1		2		3		4		5	6
PLANT INJURY: none, light, moderate, severe KIND OF INJURY: disease, insect, rodent, hail, drought, grazing, flood, winter, fire, machine		1		2		3		4		5	6
WEED INFESTATION: none, light, moderate, severe		1		2		3		4		5	6
WILDLIFE USE v. high, high, moderate, low, none		1		2		3		4		5	6
SEED PRODUCED	YES / NO	1		2		3		4		5	6
DROUGHT TOLERANCE	N/A	1		2		3		4		5	6

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ID-ECS-04
2011

PLANT MATERIALS – EVALUATION OF DEMONSTRATION/PLOT PLANTINGS

FLOOD TOLERANCE	N/A	1		2		3		4		5		6	
SALT TOLERANCE	N/A	1		2		3		4		5		6	
ACID TOLERANCE	N/A	1		2		3		4		5		6	
WATER TOLERANCE	N/A	1		2		3		4		5		6	

IRRIGATION KIND _____ FULL SEASON _____ LIMITED SEASON _____

FERTILIZER, NITROGEN LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, PHOSPHORUS LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, POTASSIUM LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, OTHER _____ LBS/ACRE _____ DATE APPLIED _____

COOPERATOR'S EVAL.	N/A	1		2		3		4		5		6	
ADAPTED TO SITE	YES / NO	1		2		3		4		5		6	

COMMENTS:

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ID-ECS-05
2011

PLANT MATERIALS – EVALUATION OF SEED INCREASE PLANTINGS

COOPERATOR _____ PLANTING NO. _____

RELEASE NAME 1. _____ SPECIES NAME _____

FIELD OFFICE _____ PURPOSE SEED INCREASE

EVALUATION DATE _____ EVALUATOR _____

AVE. ANNUAL PPT _____ (CIRCLE) FAVORABLE AVERAGE UNFAVORABLE

INSTRUCTIONS; WRITE IN THE APPROPRIATE DATA - NUMBER FROM BELOW OR ANSWER

1 - EXCELLENT 3 - GOOD 5 - FAIR 7 - POOR 9 – VERY POOR 0 - NONE

STAND SUCCESS 1 _____

VIGOR 1 _____

SEED PRODUCED 1 _____

SEED PRODUCTION POUNDS / ACRE BULK _____ CLEAN _____

PLANT HEIGHT INCHES 1 _____

FORAGE PRODUCTION YIELD - TON / AC. 1 _____

PLANT INJURY: none, light, moderate, severe 1

KIND OF INJURY: disease, insect, rodent, hail, drought, grazing, flood, winter, fire, machine 1 _____

WEED INFESTATION: none, light, moderate, severe 1 _____

STAND MANAGEMENT: 1 _____

IRRIGATION KIND _____ FULL SEASON _____ LIMITED SEASON _____

HERBICIDE KIND _____ HERBICIDE RATE _____

FERTILIZER, NITROGEN LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, PHOSPHORUS LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, POTASSIUM LBS/ACRE _____ DATE APPLIED _____

FERTILIZER, OTHER _____ LBS/ACRE _____ DATE APPLIED _____

COOPERATOR'S EVAL. 1 _____

COMMENTS: