

James E. “Bud” Smith Plant Materials Center 2013 Progress Report of Activities



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<http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/central/txpmc/>

Wheat with a Summer Cover for Soil Health Improvement

The PMC is demonstrating the use of a summer cover crop to improve soil health in a wheat cropping system. A cover crop mix with 80% legumes and 20% grasses was planted in the spring of 2013. Another block was planted using cowpeas as a monoculture. The third block contained no cover crop and was managed using conventional tillage methods. Cover blocks were terminated and wheat was planted in late October 2013. Soil samples have been taken to determine fertilizer requirements needed to produce 35 bushels per acre, which is the average yield in the Rolling Red Plains. Yield data, moisture, and temperature readings will be taken to compare the different management practices. The goal of the demonstration is to show producers and field office staff that soil health can be improved without sacrificing yield production.



1Wheat planted into Cover Crop



2Wheat planted into Cowpea Monoculture



3Wheat planted using Conventional Tillage

Summer Cover Crop Species Evaluated for Adaptability

With the increase in soil health emphasis there is a need to identify which cover crops are best adapted to the PMC service area. Species used in cover crop mixes can have different areas of adaptation based on where the plants originated. This study compares fifty individual cool and warm season species to determine which ones are adapted to the service area. The study includes grasses and legumes commonly used in summer mixes. Plots were planted on 22 June-2013 and harvested on 4 September-2013. Data was collected for days to 75% emergence, overall plant height, days to 75% cover, and yield at termination, which coincides when wheat is planted in the Rolling Red Plains. The study gives field offices and the general public the opportunity to see what these species look like growing in the field under normal growing conditions. It also provides NRCS with cover crop performance data on the various cover crops for inclusion in the cover crop practice standard plant list.

CommonName	ScientificName	Days to 75% Emergence	Plant Height (in)	Days to 75% Cover	Yield (lbs/ac)
Buckwheat	<i>Fagopyrum esculentum</i>	5	21	60	2,596
Cowpeas	<i>Vigna unguiculata</i>	8	22	60	5,340
Essex Rape	<i>Brassica napus</i>	13	7	60	1,227
Forage Collards	<i>Brassica oleracea</i>	14	7	60	827
Corn	<i>Zea mays</i>	9	25	53	9,001
Guar	<i>Cyamopsis tetragonolobe</i>	10	18	60	5,083
Hybrid Forage Sorghum	<i>Sorghum bicolor</i>	9	43	55	11,072
Hybrid Grain Sorghum	<i>Sorghum bicolor</i>	11	39	55	10,366
Pearl Millet	<i>Pennisetum glaucum</i>	14	34	45	8,032
Kenaf	<i>Hibiscus cannabinus</i>	7	33	53	5,937
Lab Lab Bean	<i>Lablab purpureus</i>	10	19	64	4,135
Japanese Clover	<i>Kummerowia striata</i>	>14	11	>75	3,043
Sericea Lespedeza	<i>Lespedeza cuneata</i>	>14	13	>75	2,734
Brown Top Millet	<i>Urochloa ramosum</i>	>14	30	53	7,956
Proso Millet	<i>Panicum miliaceum</i>	>14	37	60	8,039
Foxtail Millet	<i>Sertaria italica</i>	>14	34	60	6,008
Japanese Millet	<i>Echinochloa frumentacea</i>	>14	30	60	6,255
Pearl Millet	<i>Pennisetum glaucum</i>	13	31	60	9,937
Mungbean	<i>Vigna radiata</i>	8	21	38	6,293
Partridge Pea	<i>Chamaecrista fasciculata</i>	>14	27	60	8,072
Pea	<i>Vigna sinensis</i>	7	24	60	5,301
Peanut	<i>Arachis hypogaea</i>	14	10	60	5,496
Radish	<i>Raphanus sativus</i>	9	1	>75	N/A
Rice	<i>Oryza sativa</i>	14	19	>75	2,808
Sesame	<i>Sesamum indicum</i>	14	34	45	8,777
Sesbania	<i>Sesbania exaltata</i>	13	51	60	5,987
Sorghum Sudangrass Hybrid	<i>Sorghum bicolor</i> spp. <i>drummondii</i>	8	50	57	10,022
Soybeans	<i>Glycine max</i>	13	19	68	4,351
Sunflower	<i>Helianthus</i> spp.	8	25	60	4,284
Sunn Hemp	<i>Crotalaria juncea</i>	8	29	62	5,164
Wild Reseeding Soybeans	<i>Glycine soja</i>	>14	8	>75	3,294

Transitioning to Smaller Breeder Blocks to Supply Seed Industry



The PMC is currently transitioning from larger scale production blocks, which are used to supply the seed industry with pure seed sources, to smaller blocks, also called breeder blocks. The large blocks are labor intensive and very expensive to maintain. The smaller 1/10th acre blocks will make it easier to produce high quality seed.



Smaller blocks will be easier to keep weed free and can be closely monitored for contamination. The new blocks will also allow more time by the staff to concentrate on other projects and research. The breeder blocks will be harvested annually and the seed used to supply the seed industry with enough seed to plant larger increase blocks. Breeder seed of cultivar releases and GO

seed of germplasm releases will continue to be distributed by the Texas Foundation Seed Service to area seed companies. A full list can be obtained from their website at <http://tfss.tamu.edu> or by calling them at (940) 552-6226. Currently, the PMC maintains and supplies seed for twenty-eight releases. These releases include grasses, legumes, forbs, and woody plants.

Current Plant Collection List

The PMC is continuing to collect twelve native, perennial plant species for evaluation in various conservation uses. The species are:

- Plains lovegrass (*Eragrostis intermedia*)
- Roundhead lespedeza (*Lespedeza capitata*)
- Texas cupgrass (*Eriochloa sericea*)
- Prairie bundleflower (*Desmanthus leptolobus*)
- Hall's Panicum (*Panicum hallii*)
- Switchgrass (*Panicum virgatum*)
- Scurfpea (*Psoralea tenuiflora*)
- Narrowleaf globemallow (*Sphaeralcea angustifolia*)

For more information on these plant species, see the website at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/tx/plantsanimals/?cid=nrcs144p2_003036 and click on James E. "Bud" Smith PMC. These plant species will be evaluated for potential use in conservation practices such as Range Planting, Upland Wildlife Habitat Management, Conservation Cover Riparian Herbaceous Cover, and others.

Program Emphasis

The mission of the James E. "Bud" Smith PMC is to develop and transfer effective state-of-the-art plant science technology to meet customer and resource needs. The PMC conducts plantings and studies at the Center and off center with cooperating partners. Plant and technology development objectives of the PMC include:

- Soil Health
- Erosion Control - wind and water
- Range and Pasture Improvement
- Wildlife Habitat Improvement
- Water Quality Improvement on Agricultural Land
- Biofuels
- Saline Site Restoration

James E. “Bud” Smith Plant Materials Center

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) James E. “Bud” Smith Plant Materials Center (PMC) located near Knox City, Texas, was established in 1965. It is one of the 27 Centers located throughout the United States. The Center is responsible for developing conservation plants and cultural techniques for use within targeted Major Land Resource Areas (MLRA) in Texas, Oklahoma, Kansas, Colorado, and New Mexico. The Center is also responsible for producing Breeder and Foundation seed of plant releases and assisting in commercial development and promoting their use in natural resource conservation. The PMC serves all or portions of 136 counties in Texas that comprises parts of 25 MLRAs, and the areas served in all or portions of 39 counties in southwestern Oklahoma comprising parts of thirteen MLRAs. The PMC also serves a portion of seven counties in southwestern Kansas including parts of four MLRAs, a portion of one county in the southeastern corner of Colorado comprising parts of three MLRAs, and a portion of seven counties in eastern New Mexico comprising parts of seven MLRAs. The PMC is located approximately four and a half miles northwest of Knox City, Texas, in the Rolling Red Plains MLRA.



James E. “Bud” Smith PMC Personnel

- Dr. Gary Rea- Manager
- Brandon Carr- Soil Conservationist
- Randy Kuehler- Biological Science Technician (Plants)

Visit the PMC website for more information and publications:
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/central/txpmc/>