

Fort Valley Experimental Forest Research Projects: 1909 -1926

Compiled by Susan D. Olberding from material in the files of the USFS Fort Valley Experimental Forest archives, RMRS, Flagstaff, AZ

1909:

Source: "Fort Valley Experiment Station List of Experiments" 1 December 1909.

- X-1: Brush scattering experiment. Greenlaw area. S34, T22N, R8E and S3, T21N, R6E. 126 acres, begun Fall 1908.
- X-2: Seeding experiment, Greenlaw area. S33, T22N, R8E, 18 acres, begun Fall 1908.
- X-3: Brush scattering experiment, Fort Valley. S27, T22N, R6E, 20 rods west of ranger stable. 14' x 14'. Begun Fall 1908. (Note: Ranger stable was just north of old Entomology lab)
- X-4: Seeding experiment, Fort Valley. S27, T22N, R6E, @ 10 acres, Fall 1908–Summer 1910.
- X-5: Planting experiment, Fort Valley. S27, T22N, R6E, 6 acres. Spring 1909–Summer 1910
- X-6: Planting experiment, Greenlaw area. S33, T22N, R8E. 7 acres. Spring 1909–Summer 1910.
- X-7: Planting experiment, Riordan area, south of Flagstaff. S33, T21N, R7E. 7 acres. Spring 1909–Summer 1910.
- X-8: Seeding experiment, Riordan area, south of Flagstaff. S33, T22N, R7E, adjoining above. Summer 1909–Summer 1910.
- X-9: Planting experiment, Fort Valley Meteorological Station 1. 54 plants, 1909, 54 plants, Spring 1910.
- X-10: Planting experiment, Fort Valley Meteorological Station 3. 54 plants 1909, 54 plants Spring 1910.

1910:

Source: Coconino Experiment Station List of Experiments 1 September 1910 and report dated 1 October 1910.

- X-1: Brush Scattering Experiment, Greenlaw area. S34, T22N, R8E and S3, T21N, R6E. 126 acres. Begun Fall 1908.
- X-2: Seeding Experiment, Greenlaw area. S33, T22N, R8E. 18 acres, begun Fall 1908.
- X-3: Brush Scattering Experiment, Fort Valley. S27, T22N, R6E, 20 rods west of ranger stable. 14' x 14'. Begun Fall 1908.
- X-4: Seeding Experiment, Fort Valley. S27, T22N, R6E, @ 10 acres. Fall 1908–Summer 1910.
- X-5: Planting Experiment, Fort Valley. S27, T22N, R6E. 6 acres. Spring 1909–Summer 1910

- X-6: Planting Experiment, Greenlaw area. S33, T22N, R8E. 7 acres, Spring 1909–Summer, 1910.
- X-7: Planting Experiment, Riordan area, south of Flagstaff. S33, T21N, R7E. 7 acres. Spring 1909–Summer 1910.
- X-8: Seeding Experiment, Riordan., S33, T22N, R7E, adjoining above. Summer 1909–Summer 1910.
- X-9: Planting Experiment, Fort Valley Meteorological Station 1. 54 plants, 1909. 54 plants, Spring 1910.
Planting Exp, Fort Valley Meteorological Station 3. 54 plants, 1909, 54 plants, Spring 1910.
- X-10: Planting Experiment, Fort Valley Meteorological Station 3.
- X-11: Study of light requirements of yellow pine seedlings, Greenlaw area. S4, T21N, R8E. Begun 1909.
- X-12: Study of light requirements of yellow pine seedlings, Gosney’s Pasture S25, T21N, R6E, 1908. (2 different Experiments on same land.)
- X-13: Study of light requirements of yellow pine seedlings, Gosney’s Pasture S25, T21N, R6E, 1908. (2 different Experiments on same land.)
- X-14: Process of natural reproduction. Sample Plot, Greenlaw area, Gosney’s pasture. S30, T21N, R7E. 1908.
- X-15: Same as above, on S33, T22N, R8E. 1908.
- X-16: Grass Seedling Experiment , Fort Valley. S27, T22N, R6E, Park. 7 acres sown Summer 1909, 7 acres sown, Fall 1909.
- X-16B: 40 rods west, plowed ground, 6 acres sown. Summer 1910.
- X-17: Grass Seeding Experiment, Fort Valley. S27, T22N, R6E. Forest. 4 acres sown Summer 1909; 3 acres sown Fall 1909.
- X-18: Study of the influence of the forest upon meteorological conditions, Fort Valley headquarters.
- X-19: Permanent Sample Plots—cut-over areas, Coconino National Forest: S1: S27, T22N, R6E, 325 acres; S2: S25, T22N, R6E, 160 acres; S3: S24, T22N, R5E, 480 acres.
- X-20: Seeding Experiment—Jeffrey pine, Greenlaw area. S34, T22N, R8E. Fall 1909–Summer 1910.
- X-21: Germination tests of seeds from WYP of different conditions of age and health. 22 trees, 1908, 100 trees, 1909.
- X-22: Nursery experiment, Fort Valley, Park and Forest (WYP), Campbell’s Camp (Douglas fir), Slope east side of saddle (Engelmann Spruce).
- X-23: Planting experiment, Campbell’s Camp, Douglas fir. S7, T22N, R7E.
- X-24: Sowing experiment, Campbell’s Camp, Douglas fir. S7, T22N, R7E.
- X-25: Sowing experiment, east side of Salle (saddle?), SF Peaks Englemann Spruce.
- X-26: Determination of relative amount of damage to reproduction by grazing during different seasons of the year.
- X-27: Occurrence of double annual rings.
- X-28: Durability of different species for fence posts.

X-29: Management of composite type on Apache National Forest.

X-30: Study of influences of mistletoe upon growth of WYP.

Source: The 1910 Coconino National Forest (or ES?) Annual Report:

(12/20/1910): lists the following investigations as completed or in progress:

Completed:

1. Reproduction of WYP. Failure to regenerate is due to adverse climatic conditions, but fairly good reproduction can be obtained by conservative cutting, fire exclusion, and regulation of grazing.
2. Meteorological Studies: Forest has a decided moderating influence upon temperature extremes, wind movement, and evaporation as compared to non-forest.
3. Seed Tests: Comparison of different ages and conditions of WYP with respect to germinative quality of seed.
4. Injury to reproduction by grazing. Less damage during summer when green feed is abundant than in spring and fall. Less damage when adequate water.
5. Management of mixed stands on the Apache NF. Management plan for the mixed stands of WYP, Douglas fir, and blue spruce.

In progress:

1. Planting. WYP, limited scale because of lack of hardy, acclimated stock.
2. Sowing. Broadcast sowing of all species a total failure due to rodents, birds, damping off, drought, frost.
3. Nursery. Plan is to grow only enough to supply the needs for Experimental planting. Goal is fibrous root systems.
4. Permanent Sample Plots. Four on a total of 1286 acres established in 1909, 1910 on Coconino. Object is to ascertain rate of growth, loss from windfall and lightning, effect of different degrees of cutting, brush disposal, grazing, and other factors upon reproduction. Will be remeasured every 5-10 years
5. Effect of Mistletoes. Several hundred trees, affected and unaffected, measured and photographed. Future exams to show effect of mistletoe upon rate of growth and tree development.
6. Durability of different trees for fence posts. 10-30 posts from eight local species set in ground as fence under uniform conditions. Each post is numbered, described, and its position in the fence indicated. Both green and seasoned posts from WYP, pinon, limber pine, Douglas fir, aspen, Gambel oak, alligator juniper, and one-seed juniper.
7. Range Improvement. Best grasses are being supplanted by inferior ones because former is cropped too closely and can't seed. Suggests grazing only in the fall, to allow good forage plants to go to seed. Little success in cultivating forage plants.
8. Meteorological Studies. Instrumental records are being obtained, with a view of ascertaining the climatic factors which determine the main types of forest growth in this region.

1911:

Only information available is “Planting, seeding and nursery experiments.”
Lists what was planted when and where.

1912:

Source: Partial report prepared for District 3 Investigation Committee. Projects listed by title:

- A1: Methods of combating seed destroying animals.
- B1: Brush disposal.
- C1-6: Studies on cut over areas.
- D1: Effect of Mistletoe on the growth and seed production of WYP.
- D2: Rate of decadence of mature WYP.
- D3: Root mould in transplants.
- G: Damage to reproduction by grazing on Coconino and Tusayan, begun 1910. (cooperation with grazing reconnaissance).
- G4: Recovery of WYP injured by grazing.
- I1: Insect attacks on cupped WYP.
- M1: Growth in WYP stands before and after cutting.
- M2: The relative accuracy of calipers and steel tape in measuring the diameter of trees for growth records, begun 1911, completed.
- M3: Occurrence of double annual rings of growth, begun 1910, completed, but missing.
- Met. 7: A meteorological study of parks and timbered areas in the yellow pine forests of the southwest.
- N2: Experiment in root development of WYP.
- N3: General nursery work.
- N4: Field nurseries.
- N6: Effect of spacing upon development of WYP transplants, begun 1911.
- P4: Planting Douglas Fir under aspen.
- P5: Spring planting WYP.
- P6: Top pruning summer planted WYP, begun 1911.
- P8: Effect of an aspen nurse in Douglas Fir planting.
- P10: Pot Planting.
- P11: Ball planting, begun 1911, discontinued.
- P19: Planting exotic species for ornamental purposes.
- P20: Planting in parks.
- P21: Comparison of different classes of stock in WYP planting.
- P22: Comparison of wide and narrow holes and prepared spots in WYP planting.
- P23: Planting sites for WYP.
- P24: Planting methods for WYP.
- P25: Planting methods for Douglas Fir.
- P26: Comparison of different classes of stock in Douglas Fir planting.

P27: Width of planting holes for Douglas Fir.
P28: Early and late spring planting of Douglas Fir.
R2: The loss of seedlings in the forest during the early stages of development, begun 1908.
S1: Influence of source of seed upon the character of WYP seedlings, begun 1908.
S2: WYP breeding, begun 1911. Se1: Broadcast sowing WYP, begun 1908.
Se9: Seedspotting pinon pine, begun 1911.
Se10: Seedspotting Chilgoza pine, begun 1910.
Se11: Seed Spotting Jeffrey Pine.
Se13: Seed Spotting WYP.
Se14: Seedspotting Austrian pine.
Se15: Seed Spotting Black Locust.
Se16: Seed Spotting Douglas Fir.
Se17: Seedspotting Norway spruce.
Stra.1: Influence of a forest cover and rate of melting of snow and upon runoff, begun 1910.
T1: Type Studies: Study of the composite type, Apache NF, completed.
U1: Utilization: Durability of fence posts, records established 1910.

New Projects Proposed for 1912:

Insects: Insect attacks on cupped WYP.
Planting: Advantage of wide holes and prepared spots in wyp planting.
Comparison of different classes of stock in Douglas fir planting.
Early and late spring planting of Douglas Fir.
Planting methods for Douglas Fir.
Planting methods of WYP Width of planting holes for Douglas Fir.
Planting sites for WYP.
Planting in parks Planting under different conditions.
Seed: District seed testing.
Amount of seed production (omitted)
Soils: Non-available moisture in soils in on typical planting areas.

1913:

Source: Investigative Reports

Animals: “methods of combating seed destroying animals” discontinued as Biological Survey is doing.
New Projects approved: “Investigations of yield of WYP stands”
Dec, 1913—proposal accepted to set aside 160 acres of virgin WYP adjacent to Fort Valley headquarters to Experiment in intensive methods and as a public demonstration area.
Dec. 1913—cultivation of indigenous forage plants for artificial reseeding, progress report. 4 acres fenced, adjoining Fort Valley headquarters grounds.

- Dec. 1913—Sources of nursery stock: Fort Valley Planting Area A1, Blocks 3&4.
- Dec. 1913—Source of seed—WYP. project begun in 1908. Completed.
- Dec. 1913—General nursery practice, Fort Valley, Progress Report.
- Dec. 1913—Test of species, Fort Valley, Progress Report.
- Dec. 1913—WYP, Fort Valley Planting area A1, Block 4.
- Dec. 1913—Douglas Fir, planting area D-1, Block II & III.
- Dec. 1913—Season for planting—Douglas fir, progress report. Area D-1, Block I.
- Dec. 1913—Methods of planting Western Yellow Pine, Progress Report, Area A1, Block 4.
- Dec. 1913—Effect of cover—Douglas Fir, progress report, Area D-1.
- Nov. 1913—Study of sites—WYP planting in parks, Fort Valley Park. Also, planting in Area B-1, Block III, Plot 2; Area A-1, Block IV, Plots 13 & 33, Area C-1, Block I, Plot 31, Area D-1, Block II, Plot 14.
- Dec. 1913—Methods of planting Douglas Fir, progress report, Area D-1.
- Dec. 1913—Effect of different methods of cutting, progress report, 4 plots on Coc. NF, begun 1909.
- Dec. 1913—Brush disposal, progress report. Greenlaw Sale area (Area C-2), 126 ac.
- Dec. 1913—Natural reproduction – WYP, Progress Report, begun in 1908, 5 plots on Coc, 2 plots on Apache.
- Dec. 1913—Recuperation of different tree species from injury by grazing, progress report, FV.
- Dec. 1913—Root mould in Transplants, progress report. FV nursery.
- Dec. 1913—Effect of mistletoe upon the growth and seed production of WYP, progress report.
- Dec. 1913—Decadence of mature WYP, progress report.
- Nov. 1913—Insect attacks on cupped WYP, progress report. Related to turpentine project, FV.
- Dec. 1913—The May-Beetle in forest nurseries and experiments relative to its eradication, FV nursery.

1914:

- Dec. 1914—Forestation: Seed studies, FV, begun 1908. Forestation: Nursery Practice, FV, Ft. Bayard, Gallinas nurseries. Forestation: Sowing and planting, FV, Ft. Bayard. Management: Method of cutting, WYP, Douglas fir, begun 1910.

1915:

- Dec, 1915 report: District pathologist Dr. W.H. Long working on mistletoe and heart-rot at FV.
- New projects: Protection: Fire: Relation of moisture content to inflammability of forest litter and ground cover (climatic survey).
- Forest TypesL: Study of Forest Types.

Completed: Nursery practice: time of sowing – exp. Occurred for @ 4 yrs
 “: method of sowing
 “: root development
 : Forestation: comparison of different classes of wyp stock
 : Forestation: Sowing & Planting: Methods of sowing and planting wyp
 : forestation: Sowing & Planting: Comp. of diff. Classes of stock, D Fir
 : forestation: Sowing & Planting, methods of plant/sow, D Fir
 In Progress: Forestation: Seed studies, Source of seed, wyp Forestation:
 Nursery: Field nurseries, Dfir, wyp, Engelmann, to complete in 1916.
 Forestation: Nursery Practice, amount of seed to sow, complete @1917.
 Forestation: Nursery Practice: time and method of transplanting,
 complete @1916.
 Forestation: Sowing & Planting: study of sites, wyp
 Forestation: “ “: test of species, Jeffrey pine
 Forestation: Planting & Sowing(?): reforestation of mtn burns
 Forestation: Sowing & Planting: test of species, AZ Cypress, complete in
 1916.
 Forestation: “ “: test of species: black locust, white elm, green ash, desert
 willow, honey locust, Carolina poplar, box elder, Russian olive, Norway
 spruce, limber pine, to complete in 1917.
 Management: Brush Disposal: Effect of scattering brush after logging upon
 repro, wyp
 Management: Methods of Cutting: effect of diff. Methods, wyp
 Management: Natural Repro: nat. repro, wyp
 Mensuration: Volume growth and yeidl, wyp, Dfir, Engel, White fir
 Protection: Grazing: Recuperation of diff. Tree species from injury by
 grazing
 Protection: Disease: effect of mistletoe on growth & see production of wyp,
 complete @1917, coop with Dist. Pathologist
 Protection: Disease: Decadence of mature wyp
 Protection: Disease: Study of heart rots in relation to timber sale practice,
 complete in 1917
 Protection: Preliminary study of erosion problem

1916:

“Survey of Work Carried on by the FVES” by G.A. Pearson, 4/7/1916.
 Summarizes first years of FV work.

1916 Dist Inv committee report: Projects carried on in 1916:
 Forestation: Seed Studies, Nursery Practice, Sowing & Planting
 Management: Methods of cutting, brush disposal, natural repro
 Mensuration: Volume Studies
 Protection: Erosion Studies, fire studies, pathological studies, insect studies,
 windfall studies
 Forest Types, Economic studies

1917:

FV Bulletin, 5/1/1917: narrative list work in Management Studies (PSPs, mistletoe, rodents, windfall, lightning), Forest Types (determine site factors limiting distribution of tree species), forestation (planting, seed source, nurseries, planting of grasses), Study of Brush Disposal, Douglas Fir Volume Table.

1918:

FV Bulletin 1/1/1918: narrative on Seed Studies, Nursery Practice, Field Planting, Methods of Cutting, Natural Reproduction, Forest Types, durability of Fence Posts. 1918 report on how Silviculture needs to coop with Grazing to determine sheep numbers grazing on Forest. Suggest project: Damage by Sheep Grazing, Extensive & Historical Study, yp type, on Coc and Tusayan.

1919:

Important projects: Forestation, Methods of Cutting, Management, Study of Forest Types, and Study of Damage by Grazing.

1926:

March, 1926 Historical Facts Regarding the Southwestern Forest Experiment Station – lists when, who. Investigations in 1909: Reproduction of WYP, Forest planting, Brush Disposal, Forest Influences, Establishment of management plots.

Investigations in progress in 1926: 1,2,5 listed above, plus Reproduction & mgmt of Douglas fir and Engelmann spruce, forest types, thinnings, erosion, life history and control of porcupines.

1935–53:

Research projects are found in the USFS Southwestern Forest and Range Experiment Station Annual Reports (copies available at RMRS, Flagstaff, AZ).