

## Picture the Past

# The 1936 Fisher Seminars on Experimental Design at the Appalachian Forest Experiment Station

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Sir Ronald Alymer Fisher (1899–1975) is considered by many statisticians as the “Father of Modern Statistics,” and is credited with the development of the analysis of variance, among other notable achievements (Efron 1998). In this August 1936 photograph of prominent USDA Forest Service researchers (Figure 1), Fisher is probably most recognizable (front row center with glasses and beard). Fisher was well known among agricultural researchers in England for his influential book *Statistical Methods for Research Workers* (Fisher 1925). During the summer of 1930, F.X. Schumacher, biometrician and head of the Forest Service’s office of forest measurements, became acquainted with Fisher while attending his guest lectures on study design and data analysis at Iowa State College (Bruce 1999). During the next several years, Fisher published his foundational book, *The Design of Experiments*, in which he further developed his pioneering work on the principles of study design and introduced the concept of the null hypothesis (Fisher 1935). Gevorkiantz (1935), a Russian-educated mathematician at the Lake States Forest Experiment Station, was an early Forest Service advocate of Fisher’s methods, particularly the need for proper study design as the basis for high-quality research.

In the summer of 1936, Fisher was again lecturing at Iowa State (Box 1979). Aware of the growing need for proper experimental design, Schumacher arranged for Fisher to visit the Appalachian Forest Experiment Station (AFES), in Asheville, North Carolina, to provide

a week of seminars on the design of experiments for principal researchers from the 11 Forest Service experiment stations. The AFES location was likely the idea of Schumacher’s colleague, Roy Chapman. Chapman, a 1927 University of Minnesota graduate with statistical training, was located at the Southern Forest Experiment Station (SFES) in New Orleans but had been assigned to work for several years with Schumacher in the Forest Service’s Washington Office (Bruce 1999).

The seminars were organized with Fisher lecturing mornings and participating in afternoon discussion sessions to review study design and sampling problems presented by the attendees (Anonymous 1936). Common among many presentations was the use of Latin square experimental designs, which Fisher had used in 1920 for the first documented replicated forestry field study (Kerr 2014). Noteworthy among the afternoon discussions, J.G. Osborne, of the SFES, described a 1933 slash pine (*Pinus elliottii*) thinning study in southern Georgia that used a modified 4×4 Latin square (Anonymous 1936). That study is likely the first replicated forestry experiment established in the SFES (Osborne 1939). For a field trip after the seminars, Osborne, Schumacher, and Fisher drove to southern Georgia (Bruce 1999), where they probably visited the slash pine thinning study discussed in the seminars.

Following the Asheville meeting, Fisher’s immediate influence on Forest Service research may be partially measured by the papers written by seminar



**Figure 1.** Forest Service and university personnel attending the seminars on design of experiments led by R.A. Fisher, Asheville, NC, August 17–26, 1936. Front row (all names from left): G.H. Hepting, I.T. Haig, C.L. Forsling\*, R.A. Fisher, F.X. Schumacher, A.A. Hasel, T.S. Coile; Second row: F.P. Keen, V.L. Harper, S.R. Gevorkiantz, R.A. Chapman, B.L. Lexan, J.H. Buell, W.H. Meyer, A.L. MacKinney; Third row: E.H. Frothingham\*, R. Price, K.P. Davis, I.H. Sims, J.G. Osborne, Miss B. Day, R.H. Blythe, E.V. Roberts; Back row: L.E. Chaiken, B.H. Wilford, L.I. Barrett, C.R. Hursh, Miss?\*\*, Miss DeLashmot\*\*, Miss Johnson\*\*, L.H. Reineke, G.L. Schnur, C.A. Connaughton, C.A. Bickford. (\*Forsling and Frothingham were the current and former directors, respectively, of the Appalachian Forest Experiment Station; \*\*stenographer).

attendees, particularly Schumacher (Schumacher and Meyer 1937, Schumacher and Day 1939, Chisman and Schumacher 1940, Schumacher and Jones 1940). Except for direct mention of the 1936 seminars by Day (1937), Lexan (1939), and Schumacher (1945), there were few (if any) other acknowledgements of Fisher's contributions to research questions discussed during the seminars. In his 1992 oral memoir, Robert Buckman, former Deputy Chief of Forest Service Research, stated "... a very small group of Forest Service researchers who recruited R.A. Fisher [for the seminars] ... created an interest in experimental design" (Buckman 1992). Bruce (1999) evaluated Fisher's influence as "... the lectures and seminars for 40 foresters at Asheville did much to spread statistical knowledge in American forestry research and to encourage follow-up study." Eventually, the Forest Service established statistical units at each experiment station to

provide consultation to scientists and perform collaborative quantitative research with them (S. Zarnoch, personal communication, August 2, 2021).

Ronald Fisher died in 1975, but his comment related to study design made at a 1938 conference presentation remains relevant: "To consult the statistician after an experiment is finished is often merely to ask him to conduct a postmortem examination. He can perhaps say what the experiment died of" (Fisher 1938).

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