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PROBLEMS IN THE USE OF MULTIFLORA ROSE

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Introduction

During recent years much interest has developed in the use of multiflora rose, *Rosa multiflora,* for livestock fencing, prevention of soil erosion, and for food and cover for wildlife. Much of the pioneering work (Burgess, 1948) was conducted by the Missouri Department of Conservation in cooperation with the U. S. Soil Conservation Service. Other state conservation departments soon embarked on habitat restoration programs depending largely on multiflora rose as the answer to their need for an all purpose plant. Farmers, sportsmen's groups, garden clubs, scouts, etc. were strongly encouraged to incorporate use of this rose in their conservation programs.

As with many new items, insufficient data were available at the time multiflora rose was proclaimed as the complete answer to habitat restoration. Some of the data, which could have been obtained in a few years of observation of experimental plantings, has only now become available from disgruntled users. As a result, bad publicity, which might have been avoided, is in evidence from several areas. Because farmers are so important to game production, game management programs can ill afford incidents which result in strained relations with tenants and land owners.

The data being reported upon were accumulated over a period of nine years (1946 to 1954) with major emphasis in 1953 and 1954. A total of 219 plantings was studied in 10 counties in Iowa and 26 in Illinois. Of this total, 156 plantings were established to serve as "living fences", while the remainder (63) were for wildlife cover. At the time studies were made, the individual plantings ranged in age from 1 to 15 years with the following age classes represented: 1 year (21 plantings); 2 years (19); 3 years (41); 4 years (46); 5 years (49); 6 years (6); 7 years (12); 8 years (3); 9 years (3); 10 years (4); 12 years (6); and 15 years (9 plantings).

Causes of Unsatisfactory Results

Only 18% of the fence plantings four years or older were considered serviceable. An additional 36% were believed to be repairable with minimum effort. The remainder (46%) was considered entirely unsuitable as "living fences", largely because of poor stands and stunted growth.

The majority of farmers contacted (69%) reported some dissatisfaction when evaluating the rose as a "living fence". In many instances, the cause was largely the responsibility of the landowner or tenant who failed to carry out the practices rec-

ommended for the handling of the rose. However, instances of poor advisement were prevalent. This study indicated that conservation officials handling the distribution of multiflora rose often were improperly informed as to its best use. Others believed that the success of their program depended on the total number of plants distributed, regardless of whether they were properly handled or planted. Too often, unsatisfactory results occurred because of a failure to see that the most desirable sites were selected and that the plants were set out. When the site was suitable and the plants were properly handled, growth and stand results were in general quite satisfactory.

Of the problems affecting the success of multiflora rose, poor site location and improper handling were believed the most serious. Of the total plantings observed, 50% showed evidence of failure because of one or both these factors. Failures were most evident, however, in plantings established after 1949 and in those on private property. Here at least 65% showed slow growth and low survival. This perhaps indicates that less care was given to insure proper establishment when intensive use of the rose was first undertaken.

The more important factors in site location are drainage, drought, and shade. Virtually all plantings observed in drainage ways, in poorly drained bottom lands, on heavy clay pan soils, and bordering marsh areas revealed poor stands (63%) and in some places extremely slow growth. Sandy and clay pan soils and those low in humus were found to be poor planting sites, probably owing to insufficient moisture during late summer. In these sites growth was slow and the average survival only 59%, with a range of 35 to 88%. In heavily shaded sites the rose produced weak plants with long slender canes. In all probability competition for moisture, as well as sunlight, was important.

Based on information supplied by persons using the rose, 12% of the plantings did not have proper seed bed preparation. Virtually all of these (92.6%) were not successful because of low survival (average 46%) and slow growth (4-year olds averaged 27.3 inches in height).

Applications of fertilizers at planting time were infrequent (12% of the plantings) before 1951 and only slightly less uncommon thereafter (29% of the plantings). Although admittedly difficult to evaluate, available potash and phosphate seemed most critical. In southern and northern Illinois and southern Iowa (Klimstra, 1951), fertilizers are extremely important to good growth. (Burgess, 1948, reported that fertilization was of little advantage). Evidence of deficiencies was especially noticeable in counties in northeastern and southern Illinois, particularly in the latter which includes the Ozark and clay-pan regions. In central and most of northern Illinois, and the northern two-thirds of Iowa, signs of deficient fertility were uncommon.

Multiflora rose was neither mulched nor cultivated in 32% of the plantings. Growth rates of plantings mulched with corncobs, sawdust or straw were definitely superior to those that had been culti-

vated, averaging 22% greater height. It was obvious that during its initial establishment in a planting, this rose did not compete readily with other plants. Competition with blue grass, *Poa pratensis*, seemed most severe although annuals, particularly grasses, were important. However, it was apparent that once the rose became established, it dominated virtually all herbaceous vegetation to the extent of eliminating it. This has been reported as a factor resulting in serious erosion (Dickey, 1951). Competition with trees for sunlight and moisture appeared to be disastrous for multiflora rose.

The use of multiflora rose has certain climatic limitations, for winter kill of canes was apparent in virtually all regions of Illinois and Iowa. Observations indicated that the rose was not adapted to severe winters; frequently the canes froze back to the crown, and in some instances entire plants were killed. However, winter kill was not observed in plants less than three to four years of age, with the bulk of winter mortality occurring in plantings six years or older.

According to Rehder (1947), the most favorable habitat for multiflora rose is in temperature zone V (-10° to -5°F), the northern boundary of which is about on a line from Quincy to Danville, Illinois. The northern limit of zone IV (-20° to -10°) lies a short distance north and west of Illinois. Rehder stated, however, that under favorable conditions and with proper care, plants will survive in localities farther north than the zone to which they are best adapted, but these exceptions do not change the correct temperature zone for the plant. This information is based on observations on varieties of multiflora rose which have been in this country nearly 150 years, and on the experiments of horticulturists with *Rosa multiflora thunbergiana* which was introduced 80 to 90 years ago from Japan and Korea.

The boundaries of these temperature zones are greatly modified by elevation and other features, and many times form highly irregular curves northward. For example, in the northwestern corner of Illinois, due to the Mississippi River Valley, the average annual minimum temperature is about the same as that found in north central Illinois in the vicinity of LaSalle. Much the same situation occurs along the Illinois River Valley. These fluctuations mean that satisfactory plantings may occur considerably farther north in some localities than in others. As the result of modifications of temperatures, the length of growing seasons likewise may be longer. A longer growing season means plants better prepared to withstand extremes of winter.

Several plantings 6 to 10 years of age in zone IV were observed in Iowa; most of them revealed the effects of winter injury. A seven-year old planting, located at the base of a long southwest slope in the southeastern part of the state and several miles north of zone V, winter killed in 1946-47. Cold air drainage resulting from a sharp temperature drop was believed responsible; bicolor lespedeza, *Lespedeza bicolor*, which is more susceptible to cold winters, located at the crown of the same slope showed no injury. Two similarly aged plantings on a

level site 15 miles southeast had no winter injury and showed excellent growth. Horticultural plantings at the soil conservation nursery at Ames, Iowa, suffered considerable injury, and the growth was not suitable for livestock barriers. Plantings in northwest Iowa (zone III) suffered from repeated winter kill, and the species indicated little promise as a suitable livestock fence for that part of the state. In all plantings affected by climatic factors, the value for wildlife did not appear to be greatly impaired, for the old brambles remained intact with new canes growing up through them.

Evidence of winter kill of multiflora rose in Illinois was observed in Union, Pope, Williamson, Jackson, Randolph, Perry, Fayette, Macoupin, Sangamon, Mason, Warren, Knox, Whiteside, Lee, Jo Daviess, McHenry, and Lake counties. It was most prevalent (73%) in plantings in northern Illinois. All canes of three plantings between 12 and 14 years of age winter killed during 1951-52 in southern Illinois, whereas younger plantings showed little evidence of any loss.

Although winter killing did not decrease the value of the rose as a wildlife cover, and in many cases did not affect its use as a living fence, many farmers (83.5%) expressed dissatisfaction when the dead canes were observed. They were not greatly impressed with the fact that new canes resulted in a thicker growth and formed a more impenetrable barrier. Their common reply was that such information had not been provided; in fact, in most cases they reported being informed that the rose did not suffer from cold weather. Such an impression was provided by Steavenson (1947: 4) when he stated—"It is climatically adapted to much, if not most, of the farming areas of the United States."

Spreading of the Rose

During the initial program of promotion of the rose emphasis was placed on the fact that this rose would not spread or become a nuisance (Burgess, 1948; Steavenson, 1948; Campbell, 1948; Anderson, 1948; Edminister and May, 1951). Much evidence, however, indicated that it does spread under certain conditions. Those who have worked for several years with multiflora rose as an understock for grafting of garden roses recognized its sturdy and rampant growth (Blackburn, 1951; Scofield, 1951). Blackburn (1951) stated that plants reached a height of five to seven feet in about four years and then arched out at the sides with lateral growth surpassing the height. Natural spread of branches was then augmented by a few suckers and numerous layers, resulting in an impenetrable thicket from a single plant. It was his opinion that one should consider with care before planting multiflora which is to be left more or less unattended. Rosene (1950) suggested need of control, if the rose was to be kept from taking over idle land and unimproved pastures in the southeast. Considerable emphasis has been placed on control of the plant in the east and northeast (Dickey, 1951; Crooks, 1952; Lloyd and May, 1953). All data, however, appeared to indicate a problem only where idle or poorly man-

aged land was adjacent to the plantings.

During this study spreading was observed to result principally from seeds and layering; however, a few instances of suckering were noted. Rodents, birds, and water were probably responsible for most of the seed distribution, for new plants were most common where mouse activity was common, near roosting and resting sites for birds, and in natural drainageways. Evidences of layering were observed in 92% of all plants 4 to 5 years or older which were investigated, regardless of the planting site. Layering was most evident when the rose was growing on light sandy and heavy humus soils, possibly because of less competition in the former sites and a more luxuriant growth in the latter. One planting on a sandy soil showed an average of 7 to 8 new plants for each 15 linear feet of hedge. Some of these plants were five feet from the original row. Much of the layering had resulted from lateral branches touching the ground and taking root, a situation which Steavenson (1946) reported as not occurring. However, several instances were observed to have resulted from plowing under the tips of branches and from wheels of farm machines which pressed branches into the soil. Also, new plants were noted where cattle had trampled branches into the soil. As the result of continued layering, plantings will increase in width and only intensive cultivation or special control measures can prohibit this spread.

New plants resulting from seeds were noted largely in idle areas and poorly managed pastures. Although observed in both Iowa and Illinois, this problem is most serious on the Crab Orchard National Wildlife Refuge, Carterville, Illinois. Here volunteer rose is to be found almost anywhere in the general area of plantings established during the initial reclamation of the refuge area. It is evident that many plants come from seeds which were waterborne in natural waterways. However, most new plants are probably the result of bird or rodent transportation because of location of the growing site.

A growth habit of the rose which may become undesirable is its "climbing" habit when adjacent to other shrubs or small trees. There are several instances of multiflora rose actually producing long slender canes like typical "ramblers" or "climbers". In two extreme instances, canes reached a height of 19.5 feet. From one cane extending along the ground as many as six new plants have been noted.

Three instances of spreading from seed were observed in a mowed pasture in Lee County in north central Illinois. After two yearly mowings in one area the number of canes on each plant increased considerably and it is doubtful that a mower could continue to sever the thick clump which appeared to be developing. It has been noted (Baskett, 1953) that such clipping appears beneficial to the rose, as it increases the number of canes per plant. Therefore, mowing in the long run can probably be only a temporary measure of control. Once a plant reaches four to five years in age, a conventional mower might be useless (Blackburn, 1951). Fire as a control tool appears limited and is not

generally accepted. A flash fire in one planting observed did nothing but kill that part above ground. Doubtlessly some weed chemicals would do the job (Crooks, 1952).

Although the control of volunteer rose growth appears relatively simple (Crooks, 1952; Anderson and Edminister, 1954), it should be remembered that many landowners were not informed that control might be necessary. Also, the extra time and cost required to control a planting is not readily acceptable to farmers, especially when in many instances they were not initially enthusiastic about planting the rose. A single unpleasant experience by one farmer can mean poor cooperation from many farmers in habitat improvement. Several such instances were recorded during the course of these investigations. Poor cooperation often occurred despite the fact that the initial problem case was usually the result of poor farm management such as lack of weed mowing, pasture renovation, or crop rotation.

Value to Wildlife

Much has been written regarding the value of multiflora rose as food and cover for wildlife, but few if any research data are to be found (Marshall, 1953). An examination of the available writings indicates assumptions based on observations that multiflora looks as if it has great value for wildlife or that while in the field certain birds and mammals were seen in or near rose plantings (Talbert and Smith, 1948; Anderson, 1948; Steavenson, 1947; Edminister and May, 1951). Burgess (1948), reporting on farmer observations, stated that wildlife swarms into rose hedges and that songbirds and quail feed on the hips and make extensive use of the rose as cover. Wandell (1948) found no great evidence that pheasant or cottontail numbers were increased in an area near Urbana, Illinois. Johnson (1951) found pheasants utilizing the hips as food only when nothing else was provided. The birds showed no evident serious effects after a 27-day rose diet; however, there was not a close check on nutritional factors.

Observations made in Illinois and Iowa indicate that use by wildlife in winter is largely restricted to those sites where an adjacent food supply is readily available. In sections where native cover was present (unpubl. data) rose plantings yielded on the average 35% fewer game animals during December 1 to March 1.

Multiflora rose should possibly be limited to those regions of the country where cover for wildlife is eliminated and where opportunities for invasion of idle land are at a minimum. It is conceivable that extensive use of the rose in the prairie section would materially reduce wind erosion, improve moisture by catching snow and provide a fairly satisfactory haven for wild animals. In those regions where agriculture is less intense and natural succession of woody vegetation and idle land relatively common, planting of multiflora rose is believed not only unwise but in general unnecessary, for natural conditions probably offer much more for wildlife. The emphasis now being placed on multiflora in the south and southeast might well result in the establishment of another nuisance plant in

those regions (Levi, 1952). The assumption that multiflora will answer all the problems created by the advent of grassland farming is unfounded.

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