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A STUDY OF JACK PINE SEEDFALL ON THE SANDILANDS FOREST RESERVE, MANITOBA

Project MS-207

by

N. R. Walker

**FOREST RESEARCH LABORATORY
WINNIPEG, MANITOBA
INTERNAL REPORT MS-19**

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INTRODUCTION¹

In 1959 an experiment was begun to determine annual jack pine (Pinus banksiana Lamb.) seedfall in stands of varying age and density occurring on dry sand flats on the Sandilands Forest Reserve in southeastern Manitoba. Seed collections will determine whether natural seedfall is sufficient to regenerate jack pine stands in this area.

WORK COMPLETED - 1965

Seed Collection

Six seed collections from the 20-, 40-, and 60-year-old plots were made on the following dates:

May 11, 1965

June 30, 1965

July 26-27, 1965

Sept. 3, 1965

Sept. 28, 1965

Oct. 26, 1965

Seed collected from each trap and on each collection date was kept separate. Cutting tests were made on all seeds.

¹ For further details regarding experimental methods and descriptions of the area, the reader is referred to the establishment and progress reports prepared for this project (Cayford 1960, 1961, Cayford and Sims 1962, Walker 1963, 1964, 1965).

Scalped Spots

The 1/20-milacre scalp spots adjacent to each seed trap were examined for seedlings on August 27, 1965 (Table 1). Seedlings were recorded and removed and the spots were raked to mineral soil. Stocking per cent and density were highest under the 20-year-old dense stand. Stocking ranged from 0 to 20 per cent and density from 0 to 5, 340 seedlings per acre.

TABLE 1

REGENERATION EXAMINATION ON SCALPED SPOTS - 1965

Stand	No. Scalps	Per cent scalps stocked	Number of Seedlings	Number of seedlings/acre
20 yr. open	30	3.3	1	660
20 yr. dense	30	20.0	8	5,340
40 yr. open	30	6.7	2	1,340
40 yr. dense	30	0	0	0
60 yr. open	30	3.3	1	660
60 yr. dense	30	0	0	0

Litter Traps

Litter traps were emptied at each seed collection. The dense stands produced more litter than the open stands. The greatest total litter accumulation was under the 60-year-old dense stand (Table 2).

The sides of the litter traps are made from plywood, which is nailed together to form an open box. Fourdrinier wire is stapled across one open end to form the bottom. No weather damage has occurred to any traps, however traps in the 60-year-old open stand have been chewed severely each year by animals, and have been replaced periodically.

LITTER COLLECTIONS - 1965

Date	20-yr-open		20-yr-dense		40-yr-open		40-yr-dense		60-yr-open		60-yr-dense	
	lbs. per acre	depth (inches)	lbs per acre	depth (inches)	lbs per acre	depth (inches)	lbs per acre	depth (inches)	lbs per acre	depth (inches)	lbs per acre	depth (inches)
May 11	109	.011	334	.034	290	.030	326	.034	218	.022	331	.034
June 30	223	.023	407	.042	317	.033	477	.049	296	.030	440	.045
July 27	64	.006	285	.029	180	.018	214	.022	143	.015	490	.050
Sept. 3	52	.005	196	.020	115	.012	183	.019	110	.011	950	.098
Sept. 28	258	.026	98	.010	114	.012	162	.017	102	.010	32	.003
Oct. 26	108	.011	215	.022	459	.047	374	.038	461	.047	549	.056
TOTAL	814	.084	1,535	.158	1,475	.151	1,736	.178	1,330	.137	2,792	.287

SEEDFALL - 1965

Seedfall by Stand Condition

Seedfall for the period November 19, 1964 - October 26, 1965, is shown in Table 3. It was highest in the 20-year-old stands. The 20-year old dense stand produced more seed than the open stand; seedfall in the 40-year age class was higher in the open stand than in the dense stand. Total seedfall in the two 60-year-old stands was about equal, although the number of sound seeds dispersed by the dense stand was twice the amount dispersed by the comparable open stand.

TABLE 3

SUMMARY OF JACK PINE SEEDFALL

NOVEMBER 19, 1964 TO OCTOBER 26, 1965

Stand	Collection period (months)	No. seeds per acre	No. sound seeds/acre	Pounds of sound seed/acre	Sound seeds per cent
20-yr. open	11	7,180	5,085	.04	70
20-yr. dense	11	16,420	9,876	.07	59
40-yr. open	11	2,020	1,360	.01	67
40-yr. dense	11	660	0	0	-
60-yr. open	11	2,000	660	.005	33
60-yr. dense	11	2,240	1,480	.01	67

Seasonal Seedfall

Daily seedfall per acre is shown in Table 4. Seedfall in the 20-year-old dense and 40-year-old open stands was highest during October. In the 20-year-old open stand most seed fell in August; all seed dispersal in the 40-year dense stand occurred during this month. In the 60-year-old open stand seedfall was highest during September, and in the dense stand it was highest during July.

TABLE 4

SEASONAL DISTRIBUTION OF SEEDFALL NOV. 19, 1964 - OCT. 26, 1965

TOTAL SEEDFALL PER ACRE PER DAY

Stand	Period of Seedfall					
	Nov.19/64- May 11/65 \angle	May 11/65- June 30/65	June 30/65- July 27/65	July 27/65- Sept.3/65	Sept.3/65- Sept.28/65	Sept.28/65- Oct.26/65
20-yr. open	26	13	0	35	0	26
20-yr. dense	50	53	0	35	26	106
40-yr. open	4	0	0	17	0	24
40-yr. dense	0	0	0	17	0	0
60-yr. open	4	0	24	0	27	0
60-yr. dense	0	0	57	19	0	0

\angle - Seedfall shown here will be less than actual amount dispersed, since the seedtraps are covered with snow during the winter and this seed will be dispersed by the wind or eaten by rodents.

SEEDFALL

1959 - 1965

Annual seedfall to 1965 is shown in Table 5. Seedfall per month for all stands has decreased each year since 1962. Most seed has fallen in the 20-year-old stands, and the least in the 40-year-old stands. On the average, there is little difference in seedfall between open and dense stands.

TABLE 5

SUMMARY OF ANNUAL SEEDFALL

Stand	Period of Collection	Number of Months	Total seed per acre	Average seed fall per month
20-yr-open	Sept.-Oct. 1960	2	39,320	19,660
	Nov. 1960 - Oct. 1961	12	33,760	2,813
	Nov. 1961 - Oct. 1962	12	78,160	6,513
	Nov. 1962 - Nov. 1963	12	26,300	2,192
	Nov. 1963 - Nov. 1964	12	10,940	912
	Nov. 1964 - Oct. 1965	11	7,180	653
20-yr-dense	Sept. - Oct. 1960	2	32,430	16,215
	Nov. 1960 - Oct. 1961	12	50,140	4,178
	Aug. - Oct. 1962	3	25,320	8,440
	Nov. 1962 - Nov. 1963	12	34,900	2,908
	Nov. 1963 - Nov. 1964	12	35,460	2,955
	Nov. 1964 - Oct. 1965	11	16,420	1,493
40-yr-open	July - Oct. 1959	4	2,660	665
	Nov. 1959 - Oct. 1960	12	6,790	566
	Nov. 1960 - Oct. 1961	12	4,560	380
	Nov. 1961 - Oct. 1962	12	9,320	777
	Nov. 1962 - Nov. 1963	12	8,640	720
	Nov. 1963 - Nov. 1964	12	7,780	648
40-yr-dense	Nov. 1964 - Oct. 1965	11	2,020	184
	July - Oct. 1959	4	660	165
	Nov. 1959 - Oct. 1960	12	5,420	452
	Nov. 1960 - Oct. 1961	12	9,140	762
	Nov. 1961 - Oct. 1962	12	5,920	493
	Nov. 1962 - Nov. 1963	12	2,800	233
60-yr-open	Nov. 1963 - Nov. 1964	12	2,660	222
	Nov. 1964 - Oct. 1965	11	660	60
	July - Oct. 1959	4	0	0
	Nov. 1959 - Oct. 1960	12	17,730	1,478
	Nov. 1960 - Oct. 1961	12	16,710	1,392
	Nov. 1961 - Oct. 1962	12	11,300	942
60-yr-dense	Nov. 1962 - Nov. 1963	12	14,080	1,173
	Nov. 1963 - Nov. 1964	12	4,760	397
	Nov. 1964 - Oct. 1965	11	2,000	182
	July - Oct. 1959	4	0	0
	Nov. 1959 - Oct. 1960	12	19,370	1,614
	Nov. 1960 - Oct. 1961	12	16,040	1,337
	Nov. 1961 - Oct. 1962	12	14,700	1,225
	Nov. 1962 - Nov. 1963	12	5,520	460
	Nov. 1963 - Nov. 1964	12	4,840	403
	Nov. 1964 - Oct. 1965	11	2,240	204

WORK PROPOSED FOR 1966

Seed traps will be emptied monthly as permitted by snowfall. Seed will be kept separate by collection dates and by trap. Soundness of seed will be determined by a seed-cutting test.

Litter traps will be emptied with each seed collection.

The scalp spots will be examined for seedlings during August.

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