

● Clear Seeding of Alfalfa

By M. B. Tesar

Department of Crop & Soil Sciences

Seeding alfalfa alone in early spring with herbicides to control annual broad-leaved weeds is a relatively new method of establishment called "clear seeding" (Fig. 1). With this method, it is not difficult to harvest 2½ to 3 tons of clean hay in the seeding year in southern Michigan if the seeding is made in April or early May.

Clear seedings producing yields of three tons of alfalfa in the seeding year will contain 1,000 pounds of protein. This is a reasonable goal for dairymen who need homegrown protein. Clear seeding is also a sound alternative for dairymen who feel oats is not an economic crop or have little use for oat straw or have difficulty in getting good stands of alfalfa in oats.

This new system calls for seeding alfalfa alone in April or early May (the earlier the better) and harvesting 2½ tons or more of clean hay in the seeding year. Because a herbicide replaces the companion crop and provides the necessary weed



Fig. 1. An excellent stand is necessary for high yields in the seeding year. Twelve pounds per acre, band seeded with press wheels, were used in this seeding.

control, all the fertilizer, rainfall and sunshine are used by the alfalfa which provides the income during the seeding year.

Seven years of Michigan State University research shows that spring clear-seeded alfalfa yielded an average of 3½ tons of hay with 20% protein during the seeding year as shown in Table 1. Saranac alfalfa seeded on May 2, 1969, yielded 3⅓ tons per acre when cut on July 30 and September 23. In 1971 tests, Saranac seeded on April 10 yielded 4½ tons in three cuttings—July 9,

TABLE 1. Seeding-year yields of Saranac alfalfa in three separate experiments on a Conover silt loam, (S.M.G.2.5b) East Lansing. Seeded May 2, 1969; April 10, 1974; April 27, 1972.

Seed Rate (Lb/acre)	1969 (2 cuts)	1971 (3 cuts)	1972 (3 cuts)	Average (3 tests)
Tons dry hay (12% moisture) per acre)				
4	3.3	4.3	2.5	3.4
8	3.3	4.4	2.8	3.5
12	3.3	---	3.1	---
16	3.3	4.5	3.1	3.6
20	3.2	---	3.0	---
24	3.3	3.9	3.1	3.4

August 20 and October 27. In 1972 tests, Saranac seeded on April 27 yielded 3½ tons in three cuttings. Yields of alfalfa seeded in other experiments in 1973, 1974 and 1975 ranged between 3 to 3½ tons hay in the seeding year. In 1978, yields of 16 or 40 varieties of clear seeded alfalfa on an excellent Brookston loam exceeded 5 tons hay per acre; Vernal produced 4.25 tons.

Three tons of hay (12% moisture) contains 5,100 pounds of dry matter with an average of 20% protein or 1,020 pounds of protein. This protein has a value similar to that in soybean oil meal. The value of the alfalfa for protein and the feeding value of the alfalfa totals about \$200 based on current prices.

The highest yield during the seeding year is produced by using a fast-growing alfalfa such as Saranac, seeding early, cutting three times and using a seed rate of 12 to 16 pounds per acre. In the 1971 test (Table 2) three cuttings yielded 3.79 compared to 2.92 tons for a 2-cut system. Early seeding yielded 3.83 tons, 0.86 tons more than late seeding.

The two tests showed that 12 to 16 pounds of seed per acre insure greater yields, fewer weeds, and cleaner hay than if 8 pounds are used, especially when the herbicide doesn't work perfectly as in 1972. Further tests show that yields the year after taking three cuttings of a clear seeding were as good, or better than those from seedings made in oats or seeded alone in summer. This indicates that cutting three times—with blossoming at each cutting—does not hurt the plant in the seeding year.

TABLE 2. Seeding year hay yields (1971) of Saranac alfalfa sown at different seed rates with early and late spring seedings cut for hay two or three times the same year. 700 lbs of 0-10-30 at seeding, Conover loam, (S.M.G.2.5b) East Lansing.

Rate, Lb/acre	Seeded April 10		Seeded May 9		AVERAGE Early and Late Seeding	
	3 cuts ¹	2 cuts ²	3 cuts ³	2 cuts ⁴	3 cuts	2 cuts
	Tons dry hay (12% moisture) per acre					
4	4.26	3.17	2.96	2.26	3.61	2.71
8	4.40	3.62	3.53	2.65	3.96	3.14
16	4.58	3.06	3.27	2.85	3.92	2.96
32	3.93	2.96	3.41	2.84	3.67	2.90
Average	4.29	3.37	3.29	2.65	3.79	2.92
Average	3.83		2.79		3.36	

(1) 3 cuts — July 9, August 20, October 27.

(2) 2 cuts — July 20, October 1.

(3) 3 cuts — July 21, August 30, October 27.

(4) 2 cuts — August 3, October 1.

TABLE 3. Interrelationship among soil management groups.

Dominant Soil Profile Texture	Symbol	NATURAL DRAINAGE		
		Well Drained (a)	Somewhat Poorly Drained (b)	Poorly Drained (c)
Fine clay	0	0a	0b	0c
Coarse clay	1	1a	1b	1c
Clay loams	1.5	1.5a	1.5b	1.5c
Loam and silt loam	2.5	2.5a	2.5b	2.5c
Sandy loam	3	3a	3b	3c
Loamy sand	4	4a	4b	4c
Sand	5	5a	5b	5c
Muck or peat				Mc

Guidelines for Successful Clear Seeding of Alfalfa

[1] Alfalfa is well adapted to soils that are well drained or tile drained and have good moisture retention. Such soils contain reasonable amounts of clay. Those belonging to the 1.5a, 1.5b, 1.5c, 2.5a, 2.5b, 2.5c, 3a, 3b, and 3c soil management groups are good examples (Table 3). These soils can usually support good alfalfa growth during extended dry periods in the seeding year.

Seedings made on loamy sands (4a, 4b, and 4c) and sands (5a, 5b, and 5c) will likely not produce an economic yield (around 2 tons per acre) in the seeding year but clear seeding is the best method of establishing seedings on these drouthy soils. The seedings the next year will be much better than if made with oats in spring or alone in late July or early August. Farmers who have trouble getting good seedings on drouthy soils should try clear seeding in spring.

[2] If quackgrass is a weed problem, glyphosate (Roundup) at 1½ lb a.i./acre, sprayed on actively growing quackgrass at least 8 inches tall followed by plowing after several days, will kill or suppress the grass adequately (see Extension Bulletin E-434, "Weed Control Guide for Field Crops", 50 cents). Frequent tillage (every 10 days) in July through October will also kill or suppress quackgrass for a spring seeding (see Extension Bulletin E-527, "Re-establishment of Pastures and Hay Fields in One Year", free).

[3] Test the soil and correct the pH by liming to 6.8 or above (Fig. 2).

[4] The seedbed should be firm but not packed to provide good support of planting and harvesting machinery.

[5] Fertilize according to soil tests and preferably band the fertilizer under the seed. Three hundred fifty pounds of 0-14-42 will supply the phosphorus and potassium (0 + 50 + 150) for a three-ton hay crop.

[6] Inoculate (or use pre-inoculated seed) and seed 12 to 16 pounds per acre of any recommended varieties, preferably those with highest yield potential as shown in E-1098 "Recommended Varieties of Alfalfa in Michigan," free. The highest yielding varieties have outyielded Vernal by one half ton in the seeding year and are 10 to 30 percent higher yielding in subsequent years.

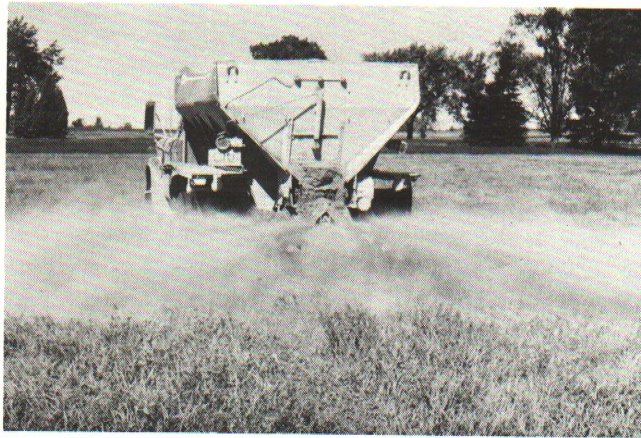


Fig. 2. Adequate lime should be applied, preferably 6 to 12 months before seeding, and incorporated to bring the pH to 6.8 or above.

[7] Seed as early as possible without damaging the physical condition of the soil. In southern Michigan, this usually occurs in April or early May. Clear seedings may be made successfully later in May, June or early July but the first-year yields will be lower than if seeded in April or early May. Seedings made up to mid-July must be made with herbicides described in [8] below or the stands will be weedy and alfalfa yields low. Seedings made after mid-July and in August are called summer seedings and generally do not need the herbicides in [8]. Frequent light tillage operations during the dry period of the summer can effectively control many annual weeds. Frost kills annual weeds which are not controlled by tillage in summer seedings.

[8] Control annual broad-leaved and grassy weeds with one of three pre-plant herbicides: (1) EPTC (Eptam) 3 pounds active ingredient (a.i.) per acre is first choice because of the broadest range on broad-leaved and grassy weeds; (2) benefin (Balan), 1 1/8 pounds a.i./A; or (3) profluralin (Tolban), 3/4 lb a.i./A. All three are sprayed (Balan can be granular) on the soil and should be incorporated into the soil immediately after application. Or, 4-(2,4-DB) (Butoxone or Butyrac 200), 1 lb a.i./acre, may be applied post-emergence to control broad-leaved weeds when alfalfa is in the 2-3 trifoliolate leaf stage and *weeds are small*, usually four to six weeks after seeding. If broad-leaved weeds develop after using a pre-plant herbicide, 4-(2,4-DB) can be used in the 2-3 trifoliolate leaf stage of alfalfa. If a grass is seeded with alfalfa, only 4-(2,4-DB) can be used since the pre-plant herbicides listed above are all grass killers and will kill the seeded perennial grass.

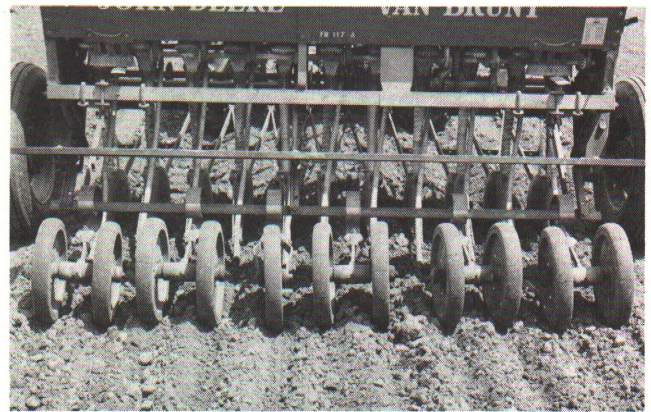


Fig. 3. The fertilizer-grain drill with band seeder attachment places the seed shallowly over a band of fertilizer. This gives maximum stimulation for the seedling from the phosphorus. Press wheels shown here cover the seed shallowly with soil and firm the soil around the seed for good germination. A fertilizer drill with band seeder and press wheels attached is the best method of getting excellent fast-growing stands of alfalfa.

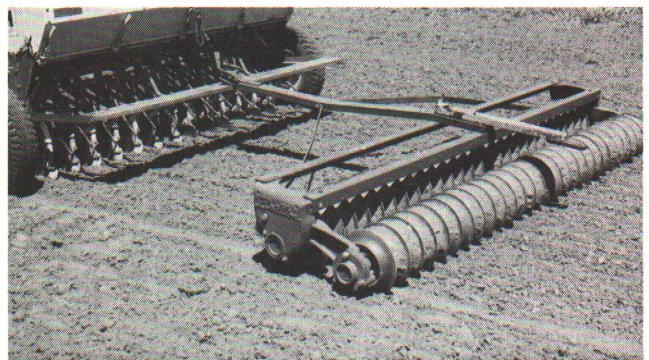


Fig. 4. Using a cultipacker instead of press wheels gives almost as good a stand and is recommended when press wheels are not available.

[9] Band seed with a fertilizer-grain-legume seed drill with band seeder attachment. The phosphorus banded under the band of seed placed on top of the ground gives the seedling a fast start by stimulating root development. A cultipacker seeder is also a satisfactory seeding method but is second choice. The seedlings have less vigor since the seed is broadcast and is not banded over the banded phosphorus.

[10] Use press wheels on the drill (Fig. 3) or tow a cultipacker (Fig. 4) behind the drill to firm the soil around the seed and cover it shallowly for fast emergence.

[11] Plan for three cuttings in the seeding year for more hay of better quality. Take the first cutting when the alfalfa is flowering. This is in early to mid-July in southern Michigan, about three months after seeding (Fig. 5). Make the next two cuttings at six-week intervals when flowering



Fig. 5. First cutting alfalfa in early July 1975, in Oceana county yielded two tons hay per acre after a clear seeding made in early May. Eptam was used, preplant, at three pounds active ingredient per acre. The second cutting yielded one ton hay per acre.

begins—about August 20 and mid-October (Fig. 6). The last cutting may need to be used for silage because of poor haying weather. Three cuttings in the 1972 tests yielded about $\frac{3}{4}$ tons more than two cuttings and the hay was of better quality—it had more protein and was leafier. If only two cuttings are made (as in northern Michigan), the second can be taken anytime after flowering begins which will be in late August or September. September cutting does not hurt next year's yield as long as the alfalfa has started to flower.

[12] Control leafhoppers by frequent harvests. If the first cutting in early July is flowering, starting to turn yellow and is stunted, leafhoppers are likely the cause. Cut immediately since yellowed alfalfa makes little growth. The young nymphs will generally be killed. Spraying the stubble to control the leafhoppers may sometimes be necessary. Check the second cutting similarly and cut if leafhoppers are causing yellowing in August. If the alfalfa in the second cutting shows leafhopper symptoms and is cut when starting to flower, it will not be damaged—and the leafhoppers will be controlled without any spraying. Leafhoppers will not likely be a problem with a third cutting made in mid- to late October.

[13] Topdress in the fall of the seeding year or next spring according to soil test and Extension Bulletin E-550 "Fertilizer Recommendations for Michigan," 35 cents, for high yields in the second and subsequent years.

Because annual yields will be higher after the seeding year, more fertilizer will be required to maintain high yields in the 5- to 8-ton range. The original soil sample can be used as the basis for topdressing with phosphorus, potassium and boron. As a guide for annual topdressing if soil tests are not available, 10 pounds of phosphate (P_2O_5) and 50 pounds of potash (K_2O) should be added for every ton of hay removed. Thus, for a 5-ton yield goal, 50 pounds of phosphate and 250 pounds of potash should be added. An 8-ton crop would require 80 pounds of phosphate and 400 pounds of potash. Boron at 2 pounds per acre is recommended on sandy loams or other coarse-textured soils.



Fig 6. Second cutting in mid-August, 1974, of a clear seeding made in late April after preplant treatment with Eptam to control annual weeds. The total yield of three cuttings was over three tons hay. Clinton county, tiled conover loam soil.

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