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Michigan State University Extension Service
O.E. Robey, C.H. Mahoney
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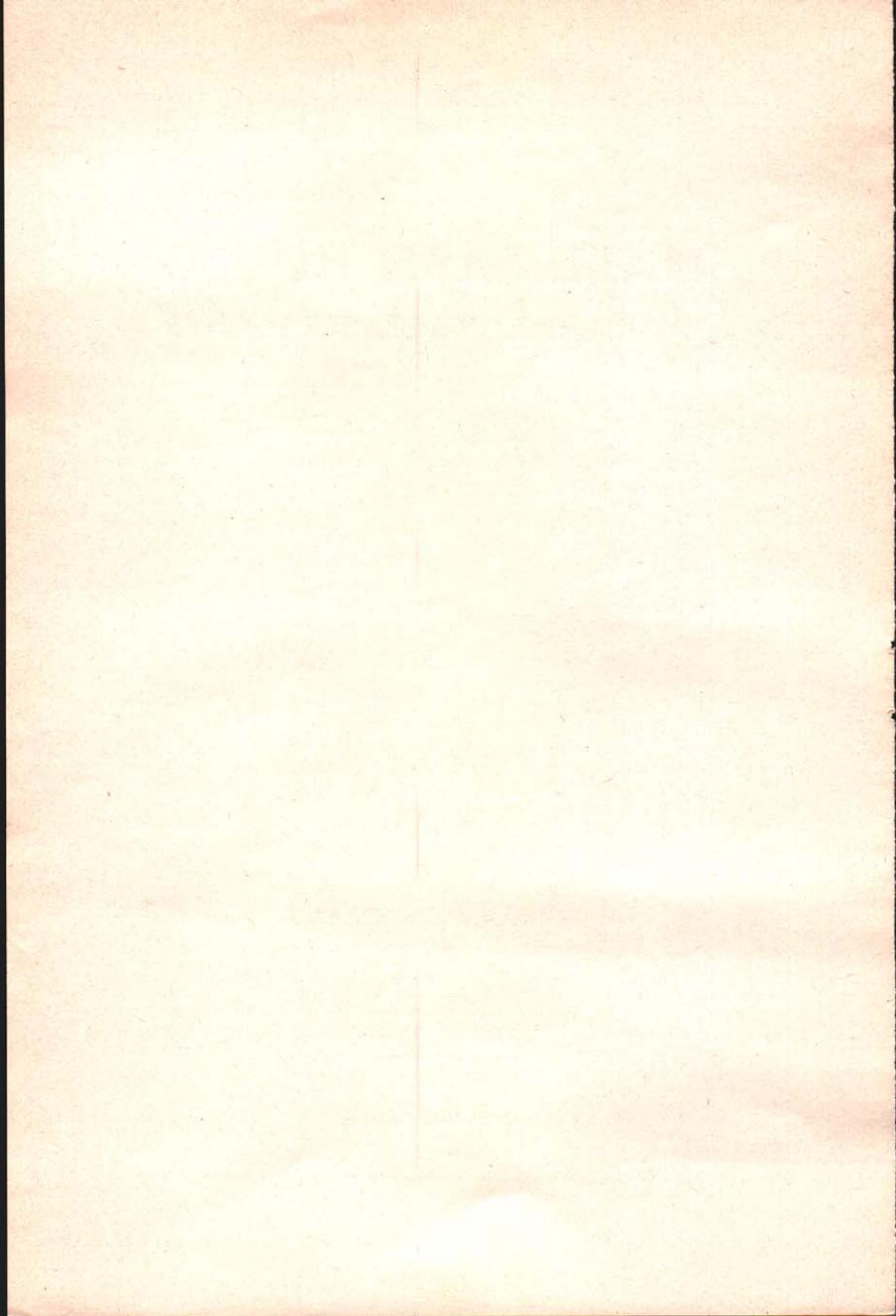
O. E. ROBEY AND C. H. MAHONEY

MICHIGAN STATE COLLEGE
Of Agriculture and Applied Science

EXTENSION DIVISION

R. J. Baldwin, Director

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SMALL SASH HOUSE FOR GROWING VEGETABLE PLANTS

O. E. ROBEY AND C. H. MAHONEY

This small sash house has been designed to meet the needs of the market gardener who wishes to raise a small number of transplants of early vegetable crops. This house will not fulfill the requirements of the gardener who grows several acres each of crops listed in Table 1. This house will hold approximately 75 standard flats (4" x 12" x 18") and the number of **seedlings** that can be grown in a standard flat will be between 800 and 1,000 when sown in rows 2 inches apart and 10 to 12 seeds per inch in the row. These seedlings must be transplanted soon after the first true leaves appear. The transplanting distances required for the various crops in the coldframe or flats are given in Table 1.

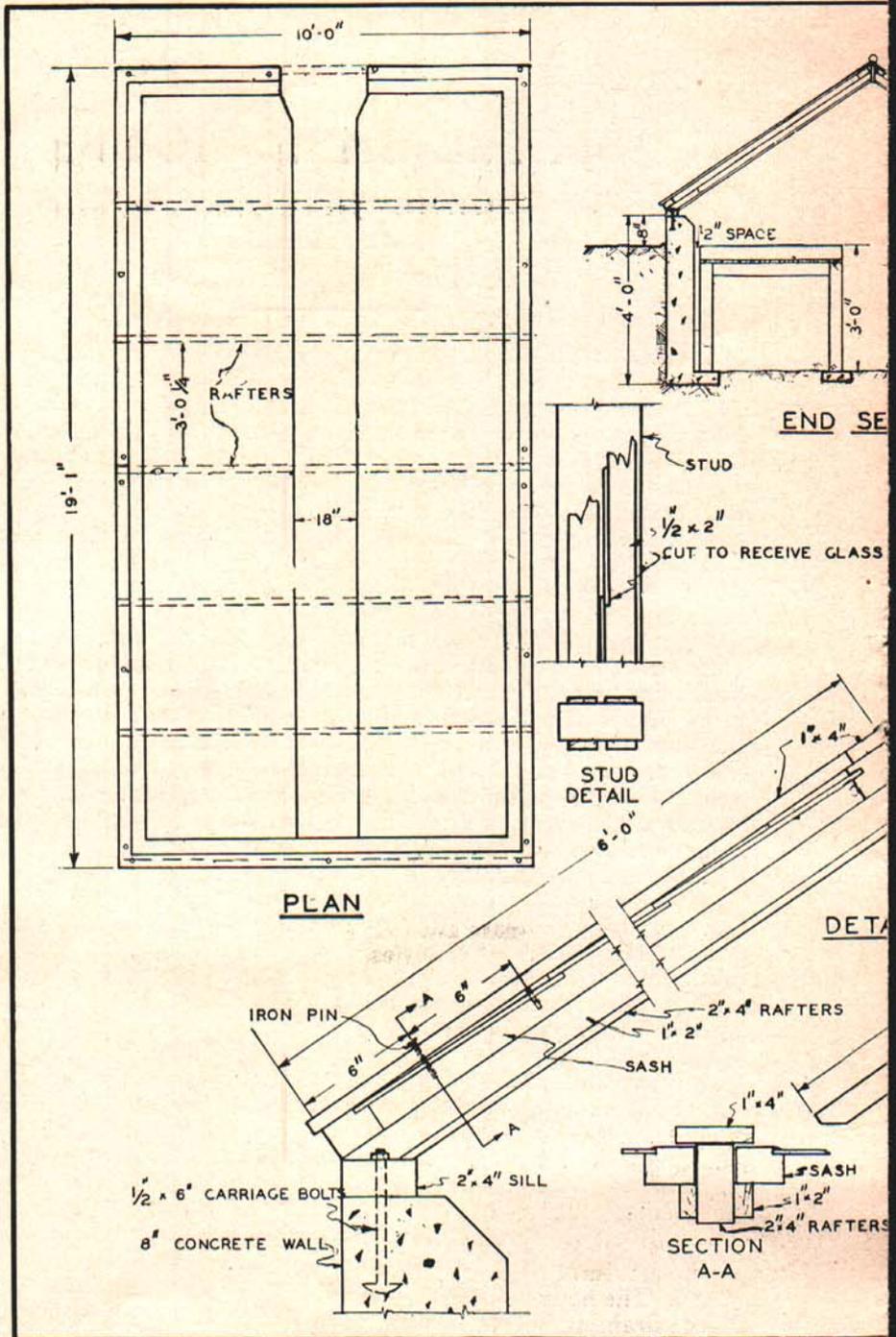
If transplants are grown in the house until field setting time only a limited number of plants can be grown. In order to produce the maximum number of transplants a 10 or 12 sash insulated coldframe should be used to carry the plants the last three or four weeks. The combination of the sash house and sash-covered coldframe will enable the grower to remove the early crops such as celery, cabbage and broccoli from the house in time to start tomatoes, eggplant, and peppers, and by the time these are ready for the coldframe muskmelons, early cucumbers and watermelons could be started.

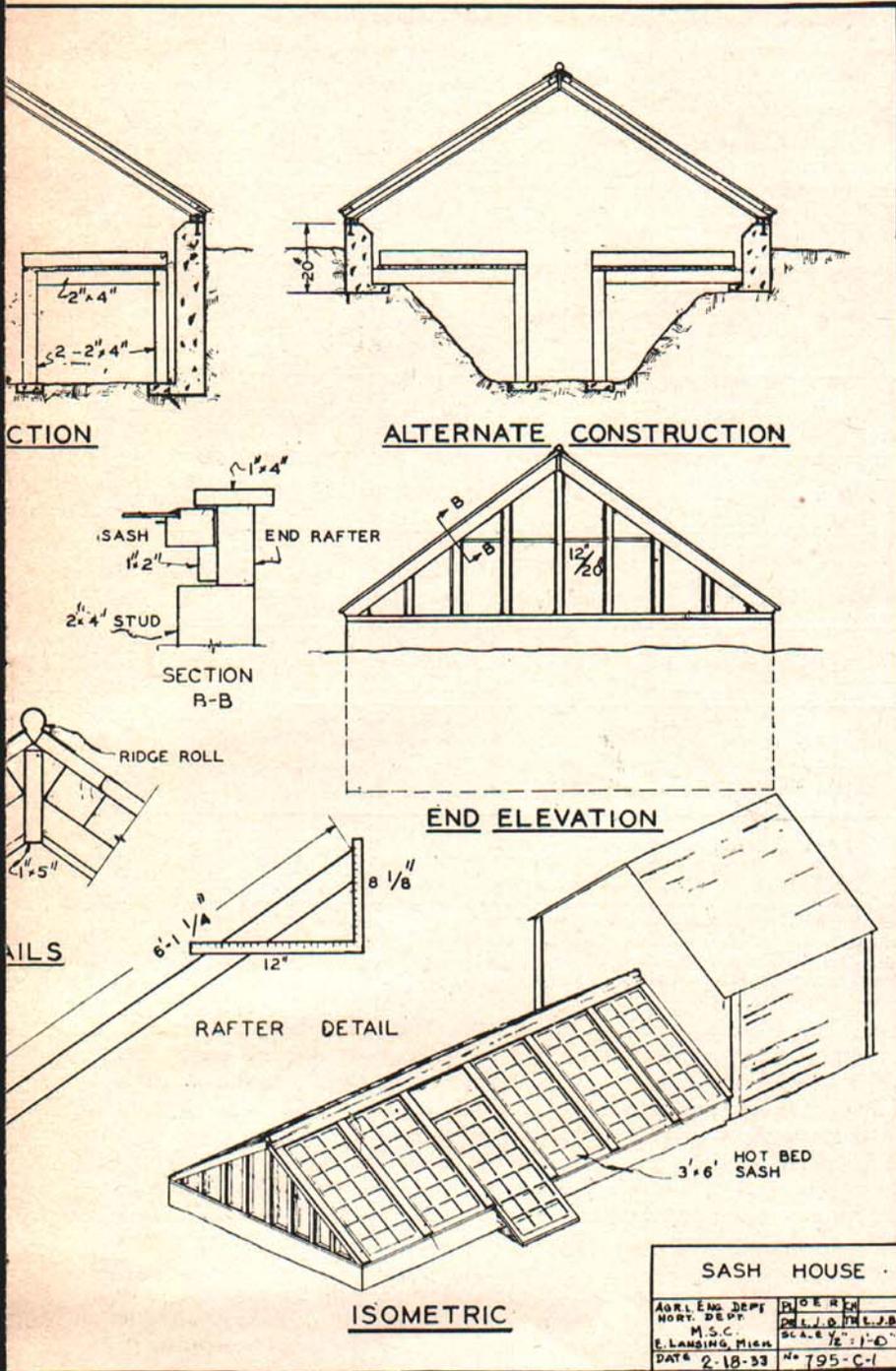
Planting dates vary greatly in different parts of the state and the suggested dates for starting the seedlings, which are given in Table 1, are only approximate but they fit fairly closely the conditions for the three southern tiers of counties.

The data which are presented in the following table are based upon perfect stands, and no allowance has been made for losses due to damping-off, freezing and plant diseases.

Soil sterilization is very important in obtaining a good stand of healthy seedling plants. Since steam is not available in this small house one of the simplest methods of sterilization is by the use of **formaldehyde dust**. A 6- or 8-per cent dust can be used at the rate of 1½ ounces per square foot worked into the soil 3 inches deep. In flats the seed may be sown immediately, but 72 hours should elapse before placing seedling plants into the treated flats. This treatment if properly done will largely eliminate losses from the various "damping-off" fungi.

The accompanying plan gives the details for constructing the sash house. The house should be located, if possible, on well-drained ground. A tile drain at the foot of the wall may be necessary to prevent water from getting into the house.





SASH HOUSE	
ARL. ENG. DEPT.	DESIGNED
MORT. DEPT.	DRAWN
M.S.C.	SCALE
E. LANSING, MICH.	1/8" = 1'-0"
DATE 2-18-33	No 795-C-1

Table 1—General data on growing vegetable transplants.

Crop	Field spacing	Time to grow. Once transplanted (weeks)	Number of plants required per acre	Transplanting distance in frames	Actual number of plants per sash. ¹ (3' x 6')	Number of sash to grow transplants for 1 acre ²	Number of transplants per standard flat ³ (3 x 12 x 18")	Approximate dates to start seedlings in Southern Michigan
Early Celery	3' x 4'	10-14	43,560	1½" x 1½"	1,120	26.7	96	Jan. 25 to Feb. 10
Cabbage Broccoli	3' x 12" 3' x 15" 3' x 18" 3' x 24"	6-7	17,424 11,616 9,680 7,260	1½" x 1½"	1,120	26.7 10.4 8.6 6.4	96	Jan. 25 to Feb. 15
Eggplant	3' x 3'	8-10	4,840	3" x 3"	288	16.8	24	Mar. 15 to Apr. 1
Lettuce	18" x 12"	5-7	29,040	1½" x 1½"	1,120	10.4	96	Mar. 20 to Apr. 1
Melons and Cucumbers	6' x 6' 6' x 4'	Bands not transplanted 4-5	1,210 (2 pls.) 1,815	4" x 4" 3" x 3"	162 288	7.5 11.2	Bands Bands	Apr. 21 to May 1
Peppers	3' x 18" 3' x 24"	8-9	9,680 7,260	2" x 2"	648	15 11.2	54	Mar. 15 to Apr. 1
Tomatoes	3' x 4' 3' x 5' 4' x 4' 4' x 5'	8-9	3,630 2,904 2,722 2,178	4" x 4"	162	22.4 17.9 16.8 13.4	3"x3"=24	Mar. 15 to Apr. 1
Watermelons	7' x 7' 8' x 8' 9' x 9'	Bands not transplanted 4-6	889 hills 680 hills 537 hills	3" x 3"	288	3.1 2.3 1.9	Bands	Apr. 15 to May 1

¹Based upon plants growing in soil or wood bands. If flats are used the number will be somewhat less.

²No allowance made for rejection of poor plants or for losses due to various causes.

³A standard flat will produce 800 to 1,000 seedlings when seed is sown in rows 2" apart and 10 to 12 seeds per inch, of cabbage, cauliflower, tomatoes, peppers, and eggplant.

Two plans are shown for the foundation. The first plan is the more desirable, although the alternate plan may be constructed with less expense for labor and concrete. The concrete may be made with a good quality of bank run gravel mixed one part cement to five parts gravel. For screened gravel, a 1:2:4 mix should be used.

The sash house is shown attached to a head house, which is desirable. It may, however, be attached to a barn or some other building. The head house makes a convenient place for working and also for the location of the heating unit. The sash house should be on the south side of the head house.

The following bill of material includes all that will be necessary to construct a house of the size shown on the plan. It does not include material for the end next to the head house nor for the head house itself.

Bill of Material**Frame**

- 6 pcs. 2" x 4" x 10' sills
- 7 pcs. 2" x 4" x 12' rafters
- 1 pcs. 2" x 4" x 14' end studs
(one end only)
- 1 pcs. 1" x 10" x 10' (ripped) ridge
pole
- 4 pcs. 1" x 4" x 10' ridge cap
- 7 pcs. 1" x 4" x 12' sash bar cap
- 12 pcs. 1" x 2" x 12' sash supports
- 50' lin. $\frac{3}{8}$ " x $1\frac{1}{2}$ " glass moulding,
end studs
- 20' $3\frac{1}{2}$ " ridge roll

Roof

- 12 3' x 6' x $1\frac{3}{4}$ " hot bed sash

Foundation

- 5 yds. gravel
- 7½ bls. cement
- 19 $\frac{1}{2}$ " x 6" carriage bolts with
washers.

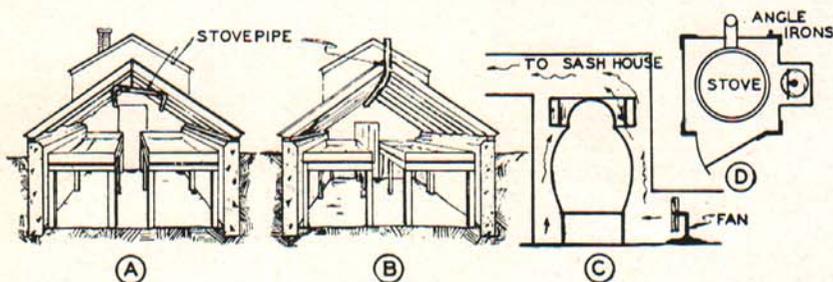
End Glass

- 8 lights 12" x 20" (one end)

Benches

- 8 pcs. 2" x 4" x 10' legs
- 2 pcs. 2" x 6" x 14' supports
- 21 pcs. 1" x 6" x 12' top

Material used for outside trim should be of some durable wood such as white pine, cypress or red wood. The second, fourth, and sixth sash bar cap may be put on with screws so that the sash can be readily removed.

Plan For Heating the Sash House

A building of this size can be heated conveniently with a stove or small furnace. The stove may be located in the head house and sometimes the smoke pipe is extended through the sash house just below the sash as shown at A and B in the above drawing. In using this method of heating, precautions should be taken to prevent leakage of smoke into the house. Stove pipe made in six- or eight-foot lengths and the joints soldered is sometimes used.

Where electricity is available, a furnace or stove may be fitted with a fan as shown at C, and the warm air blown into the sash house. This method is less likely to contaminate the air with smoke and should give a uniform temperature.

A stove to heat the house properly should have a grate 12" to 14" in diameter. It will use about 30-50 pounds of coal a day when 20 degrees above zero and 100-125 pounds a day in zero weather. An average temperature for cool season crops of 55 to 60 degrees in the

daytime and 50 to 55 degrees at night should be maintained. For warm season crops, a day temperature of 65 to 70 degrees and a night temperature of 55 to 60 degrees is necessary.

Bulletins on construction of coldframes, hotbeds, electric hotbeds, and commercial sash houses are available and can be obtained upon request.