

ROTATIONS THAT ROTATE



Alfalfa, the basis of many successful rotations and king of hay crops.



COLORADO AGRICULTURAL COLLEGE
EXTENSION SERVICE F. A. ANDERSON, DIRECTOR
FORT COLLINS

Cooperative Extension Work in Agriculture and Home Economics,
Colorado Agricultural College and the United States Department of Agriculture
Cooperating. Distributed in Furtherance of the Acts of Congress of
May 8 and June 30, 1914.



The effect of crop rotation on onions.

WHAT SHALL I PLANT NEXT YEAR?

BY T. G. STEWART, EXTENSION AGRONOMIST

There are no two farms exactly alike in Colorado and there are probably no two farmers who would agree on an ideal cropping system. This bulletin is prepared in an attempt to chart several cropping plans adapted to farming districts in Colorado. Each plan suggested can be modified to suit individual desires of most farmers in Colorado.

A farm map is perhaps the best means of studying the layout of the farm and size of fields before planning a rotation. A map drawn to scale on a strong piece of cardboard is desirable, with the fields numbered. The cropping plan in each field can be kept on this map, together with a record of yields and the record becomes more valuable as years of information accumulate.

The ideal layout for an 8-year rotation is to have the farm land equally divided into 8 fields. For 6-year rotation there should be 6 fields of equal size and a 4-year rotation on 160 A. would occupy four 40-acre fields. Fields of unequal size do not prevent the adoption of definite cropping plans tho acreages of the same crop will vary from year to year.



The result of crop rotation—beets in the Longmont area.



A heavy growth of canning peas for cannery, forage, grain or seed. Field or canning peas make good nurse crop for alfalfa or sweet clover.

On many farms it is impossible to divide the cropped land into a definite number of fields to suit the rotation. In such cases there is the possibility of planting 2 or 3 fields in the same crop and handling these fields as a unit in the rotation plans. In many cases there is



Sweet clover for pasture, hay, green manure or seed has a place in Colorado rotations.



Red clover is finding a place in Colorado cropping plans.

the possibility of combining fields and perhaps a chance to straighten those of irregular shape for the rotation and more efficient handling. A triangular-shaped field is most difficult to handle, the square field seems to be all corners, while the rectangular field seems to keep everybody in a good humor.

The advantages claimed for crop rotation and diversified farming are:

- (1) "All eggs are not in one basket," meaning that the entire farm income is not dependent upon one enterprise.
- (2) Enables the farmer to maintain fertility and high productivity.
- (3) Allows a better distribution of labor thruout the year.
- (4) Helps to control weed and insect pests.
- (5) Is the best system of farming known for controlling plant diseases.
- (6) Enables the planning of a better system of marketing products.
- (7) Allows for the production of high-quality products.
- (8) Encourages the use of deep and shallow-rooted plants.
- (9) Enables the farm family to more nearly "live at home."

The disadvantages of crop rotation and diversified farming suggested are:

- (1) Increase yields to such an extent that a surplus is created.
- (2) Do not allow for most efficient use of farm machinery due to small size of fields and small acreages of crops.
- (3) Do not allow sufficient time for fishing or vacations.
- (4) Encourage too much hand work which is expensive.

PLAINS FARMING

Non-Irrigated Cropping Plans
Suggested by Wm. Case, Fleming, Colorado

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6
Wheat	Beans	Potatoes	Barley	Wheat	Corn
Beans	Potatoes	Barley	Wheat	Corn	Wheat
Potatoes	Barley	Wheat	Corn	Wheat	Beans
Barley	Wheat	Corn	Wheat	Beans	Potatoes
Wheat	Corn	Wheat	Beans	Potatoes	Barley
Corn	Wheat	Beans	Potatoes	Barley	Wheat
Repeat	Repeat	Repeat	Repeat	Repeat	Repeat

This cropping plan provides, on 320 acres, for:

80 acres of wheat
40 acres of barley
40 acres of corn
40 acres of beans
40 acres of potatoes

80 acres pasture or miscellaneous crops.

In districts where blowing occurs, bean and potato ground can be listed in the fall, then relisted at planting time or worked down to destroy weeds and allow surface planting if desired.

SAN LUIS VALLEY ROTATION

Suggested by Potato Committee, Economic Conference, 1929

Field 1	Field 2	Field 3	Field 4
Potatoes	Small grain	Field or canning	Sweet-clover
Small grain	Field or canning	peas, seed sweet	pasture, hay or
Field or canning	peas, seed sweet	clover	green manure
peas, seed sweet	clover	Sweet-clover	Potatoes
clover	Sweet-clover	pasture	Small grain
Sweet-clover	pasture, hay or	Potatoes	Field or canning
pasture, hay or	green manure	Small grain	peas, seed sweet
green manure	Potatoes		clover
Repeat	Repeat	Repeat	Repeat

Note:—This simple rotation allows for large fields and most efficient use of machinery. If the field of sweet clover is pastured or one cutting of hay

removed, then the second growth turned under, weeds should be effectively controlled.

THE IDEAL NORTHERN COLORADO 160 A

Farm Plans

Suggested by Farm Organizations Committee, Economic Conference, Greeley, 1930
4 Acres Pasture, 11 Acres Farmstead

Field 1 29 Acres	Field 2 29 acres	Field 3 29 acres	Field 4 29 acres	Field 5 29 acres
Alfalfa	Alfalfa	Corn 14.5	Beets	Barley
Alfalfa	Corn 14.5	Barley 14.5	Barley	Alfalfa
Corn 14.5	Barley 14.5	Beets	Alfalfa	Alfalfa
Barley 14.5	Beets	Barley	Alfalfa	Corn 14.5
Beets	Barley	Alfalfa	Corn 14.5	Barley 14.5
Barley	Alfalfa	Alfalfa	Barley 14.5	Beets
Repeat	Repeat	Repeat	Repeat	Repeat

Note:—This plan was recommended for areas where potatoes were not adapted. It is planned for use with cattle or sheep feeding. Where alfalfa will give satisfactory yields it is advised to leave the alfalfa in longer than two years and use the other crops in a short rotation as follows: Corn 14.5 and barley 14.5 followed by beets followed by barley seeded to sweet clover, the sweet clover

plowed under late in the fall for corn and barley the next year. Then when the alfalfa needs reseeding, seed the barley to alfalfa instead of to sweet clover and plow up an old alfalfa sod for the corn and barley, thus shifting the fields as necessary. By the substitution of adapted crops this rotation can be readily adjusted for use in all irrigated sections of Colorado.



Potatoes after alfalfa—1047 bushels on measured acre in the San Luis Valley.



The result following sweet clover with corn—Delta county.

**NORTHERN COLORADO
IRRIGATED ROTATION PLANS**

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6
Alfalfa 5 years or as long as satisfactory yields are secured	Corn or potatoes Sugar beets Small grain Canning peas seed clover Sweet clover pasture	Sugar beets Small grain Canning peas seed clover Sweet clover pasture Corn or potatoes	Small grain Canning peas, seed sweet clover Sweet clover pasture Corn or potatoes Sugar beets	Canning peas seed clover Sweet clover pasture Corn or potatoes Sugar beets Small grain seed alfalfa Alfalfa	Sweet clover pasture Corn or potatoes Sugar beets Small grain Canning peas seed clover Repeat
Corn or potatoes	Repeat	Repeat	Repeat		

Note.—Alfalfa can be brought into the rotation by seeding small-grain field using small grain as a nurse crop, then plowing the old alfalfa either in fall or spring. Rotation on all fields, advanced 1 year. Acreage of beets can be increased each year

by cutting down acreage of corn and planting beets instead. Canning peas grown as a small-grain crop, can be cut for hay, harvested and threshed for grain or hogged and sheeped off. Sweet clover is best

handled by farm flock of sheep and dairy cows, or one cutting of sweet clover hay with second growth turned under as green manure. Some growers prefer sugar beets following sweet clover rather than corn.

ANOTHER PLAN FOR PLAINS FARMING

Field 1	Field 2	Field 3	Field 4
Corn or grain sorghum	Wheat Beans	Beans Wheat or barley	Wheat or barley Corn or grain
Wheat	Wheat or barley	Corn or grain	sorghum
Beans	Corn or grain	sorghum	Wheat
Wheat or barley	sorghum	Wheat	Beans
Repeat	Repeat	Repeat	Repeat

Note:—Under very dry conditions corn may be grown in rows 7 feet apart with the surface of soil between rows kept free of weeds until winter wheat is planted in September. Wheat stubble may be allowed to stand thruout winter or may be disked or listed immediately

after harvest. Bean land can be planted to winter wheat if the bean crop is removed early, otherwise barley may be grown. Bean land can be prevented from blowing by listing, strip listing or blind drilling with furrow drill.



Beans in the dryland rotation.

PLANS FOR THE 40 to 80 ACRE TRUCK FARM

Suggested by Professor A. M. Binkley, Horticulturist—Colorado Agricultural College

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6
Alfalfa	Beans or corn	Vine crop	Onions	Beets	Small grain-alfalfa
Beans or corn	Vine crop	Onions	Beets	Small grain-alfalfa	Alfalfa
Vine crop	Onions	Beets	Small grain-alfalfa	Alfalfa	Beans or corn
Onions	Beets	Small grain-alfalfa	Alfalfa	Beans or corn	Vine crop
Beets	Small grain-alfalfa	Alfalfa	Beans or corn	Vine crop	Onions
Small grain-alfalfa	Alfalfa	Beans or corn	Vine crops	Onions	Beets
Repeat	Repeat	Repeat	Repeat	Repeat	Repeat

Note:—This cropping plan may be modified to suit the Western Slope, Littleton or Brighton area as well as the Arkansas Valley, by substitution of adapted crops. Red clover may be used instead of

alfalfa, securing the advantages of two seed crops and, due to intensive methods that must be practiced, it is advisable to secure and use as much barnyard manure as pos-

sible. The same general plan can be adopted on smaller acreages for market gardening with a careful plan of successive or companion planting.

SAN LUIS VALLEY ROTATION.--Suggested by Small-Grain Committee, Economic Conference, 1930

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6
Alfalfa allowed to remain 4 to 6 years or as long as satisfactory yields are secured	Potatoes Sugar beets or vegetables Small grain Canning peas—seed sweet clover Sweet-clover pasture	Sugar beets or vegetables Small grain Canning peas—seed sweet clover Sweet-clover pasture Potatoes	Small grain Canning peas—seed sweet clover Sweet-clover pasture Potatoes Sugar beets or vegetables	Canning peas—seed sweet clover Sweet-clover pasture Potatoes Sugar beets or vegetables Small grain	Sweet-clover pasture Potatoes Sugar beets or vegetables Canning peas—seed sweet clover
Potatoes, etc.	Repeat	Repeat	Repeat	Repeat	Repeat

Note:—The field of alfalfa can be brought into the rotation by seeding the field of small grain, then fall or spring plowing the old alfalfa. The entire rotation should then be advanced one field, that is, potatoes following old alfalfa, beets or vegetables following sweet-clover pas-

ture. Small grain follows potatoes and canning peas follow sugar beets during the year of change.

This rotation can be modified to suit personal desires as a greater acreage of alfalfa may be desired, more potatoes and

less beets can be secured each year by using part of the beet field for potatoes, more small grain by taking part of the peafield, etc.

Regardless of modifications, each field unit should be held together.

HIGH-ALTITUDE VEGETABLE GROWING

Rotation Plan Developed by Dr. E. P. Sandsten, State Horticulturist--Used on High-Altitude Experiment Farm at Avon, Colorado.

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7	Field 8
Alfalfa	Alfalfa	Alfalfa	Alfalfa	Potatoes	Garden peas	Head lettuce	Barley-alfalfa
Alfalfa	Alfalfa	Alfalfa	Potatoes	Garden peas	Head lettuce	Barley-alfalfa	Alfalfa
Alfalfa	Alfalfa	Potatoes	Garden peas	Head lettuce	Barley-alfalfa	Alfalfa	Alfalfa
Alfalfa	Potatoes	Garden peas	Head lettuce	Barley-alfalfa	Alfalfa	Alfalfa	Alfalfa
Potatoes	Garden peas	Head lettuce	Barley-alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa
Garden peas	Head lettuce	Barley-alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Potatoes
Head lettuce	Barley-alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Potatoes	Garden peas
Barley-alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Potatoes	Garden peas	Head lettuce
Repeat	Repeat	Repeat	Repeat	Repeat	Repeat	Repeat	Repeat

Note:—Alfalfa is manured the third year and the fourth year the second cutting is turned under as a green manure instead of being harvested for hay. Garden

peas are grown to be sold as pod peas or as a seed crop. Spinach may follow an early crop of lettuce and part of the let-

tuce acreage may be devoted to some other vegetable crop. Livestock is a major enterprise on this farm.

NORTHERN COLORADO, ARKANSAS VALLEY OR WESTERN SLOPE
8-Year Irrigated Rotation Plans for the Sheep or Cattle Feeder or Dairyman

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7	Field 8
Alfalfa	Alfalfa	Alfalfa	Alfalfa	Small grain	Beets	Beets	Small grain
Alfalfa	Alfalfa	Alfalfa	Small grain	or corn	Beets	Small grain	seed alfalfa
Alfalfa	Alfalfa	Small grain	or corn	Beets	Small grain	seed alfalfa	Alfalfa
Alfalfa	Small grain	or corn	Beets	Beets	seed alfalfa	Alfalfa	Alfalfa
Small grain	or corn	Beets	Beets	Small grain	Alfalfa	Alfalfa	Alfalfa
or corn	Beets	Beets	Small grain	seed alfalfa	Alfalfa	Alfalfa	Alfalfa
Beets	Beets	Small grain	seed alfalfa	Alfalfa	Alfalfa	Alfalfa	Small grain
Beets	Small grain	seed alfalfa	Alfalfa	Alfalfa	Alfalfa	Small grain	or corn
Small grain	seed alfalfa	Alfalfa	Alfalfa	Alfalfa	Small grain	or corn	Beets
seed alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	or corn	Beets	Beets
Repeat	Repeat	Repeat	Repeat	Repeat	Repeat	Repeat	Repeat

Note:—This rotation is designed to give a maximum amount of feed crops for live-stock feeding and will maintain soil fertility if all beet land is manured each year. In districts adapted to potatoes this crop may follow the plowing of alfalfa. Vine

crops, beans, onions or other cultivated crop may be substituted for beets the second year.

Such a rotation provides on 160 A. each year:

80 acres alfalfa
 40 acres beets or 20 acres beets and 20 acres of vine crops or beans
 40 acres small grain or 20 acres corn and 20 acres small grain.