farmfutro

November 21, 2023

[59]:
```
import pandas as pd
import numpy as np
import matplotlib as mplt
import matplotlib.pyplot as plt
import seaborn as sns
```

[60]:
```
crop_data = 'D:/FDA certificate/Project/Farmfutro/New folder/Farmfutro.csv'

crop=pd.read_csv(crop_data)
crop.head()
```

[60]:

	temperature	humidity	ph	rainfall	ph after harvest	Season	DIVISIONS	States	label	Unnamed: 9	Unnamed: 10	Unnamed: 11	Unnamed: 12	Unnamed: 13	Unnamed: 14	Unnamed: 15	Unnamed: 16	Unnamed: 17	Unnamed: 18
0	20.879744	82.002744	6.502985	202.935536	5.5	Kharif	cereals	UttarPradesh	rice	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
1	21.770462	80.319644	7.038096	226.655537	5.6	Kharif	cereals	Maharashtra	rice	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2	23.004459	82.320763	7.840207	263.964248	5.7	Kharif	cereals	Punjab	rice	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
3	26.491096	80.158363	6.980401	242.864034	5.8	Kharif	cereals	HimachalPradesh	rice	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
4	20.130175	81.604873	7.628473	262.717340	5.9	Kharif	cereals	WestBengal	rice	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

```
4          NaN          NaN
```

[61]:
```
crop.size
```

[61]:
```
42028
```

[62]:
```
crop.shape
```

[62]:
```
(2212, 19)
```

[63]:
```
crop.columns
```

[63]:
```
Index(['temperature', 'humidity', 'ph', 'rainfall', 'ph after harvest',
       'Season ', 'DIVISIONS', 'States', 'label', 'Unnamed: 9', 'Unnamed: 10',
       'Unnamed: 11', 'Unnamed: 12', 'Unnamed: 13', 'Unnamed: 14',
       'Unnamed: 15', 'Unnamed: 16', 'Unnamed: 17', 'Unnamed: 18'],
      dtype='object')
```

[64]:
```
columnstodelete=['Unnamed: 9', 'Unnamed: 10',
       'Unnamed: 11', 'Unnamed: 12', 'Unnamed: 13', 'Unnamed: 14',
       'Unnamed: 15', 'Unnamed: 16', 'Unnamed: 17', 'Unnamed: 18']
crop=crop.drop(columnstodelete,axis=1)
```

[65]:
```
crop.head()
```

[65]:

	temperature	humidity	ph	rainfall	ph after harvest	Season	DIVISIONS	States	label
0	20.879744	82.002744	6.502985	202.935536	5.5	Kharif	cereals	UttarPradesh	rice
1	21.770462	80.319644	7.038096	226.655537	5.6	Kharif	cereals	Maharashtra	rice
2	23.004459	82.320763	7.840207	263.964248	5.7	Kharif	cereals	Punjab	rice
3	26.491096	80.158363	6.980401	242.864034	5.8	Kharif	cereals	HimachalPradesh	rice
4	20.130175	81.604873	7.628473	262.717340	5.9	Kharif	cereals	WestBengal	rice

[66]:
```
crop.tail()
```

[66]:

	temperature	humidity	ph	rainfall	ph after harvest	Season	DIVISIONS	States	label
2207	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2208	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2209	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2210	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2211	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

```
     States label
2207    NaN   NaN
2208    NaN   NaN
2209    NaN   NaN
2210    NaN   NaN
2211    NaN   NaN
```

[67]:
```
rowstodelete=[2200,2201,2202,2203,2204,2205,2206,2207,2208,2209,2210,
2211]
crop=crop.drop(rowstodelete,axis=0)
```

[68]:
```
crop.tail()
```

[68]:
```
      temperature   humidity        ph    rainfall  ph after harvest  \
2195    26.774637  66.413269  6.780064  177.774507               5.6
2196    27.417112  56.636362  6.086922  127.924610               4.9
2197    24.131797  67.225123  6.362608  173.322839               5.0
2198    26.272418  52.127394  6.758793  127.175293               5.1
2199    23.603016  60.396475  6.779833  140.937041               5.2

         Season   DIVISIONS     States   label
2195  Perennial   cashcrops  NorthEast  coffee
2196  Perennial   cashcrops  Karnataka  coffee
2197  Perennial   cashcrops  TamilNadu  coffee
2198  Perennial   cashcrops     Kerela  coffee
2199  Perennial   cashcrops  NorthEast  coffee
```

[69]:
```
crop.dtypes
```

[69]:
```
temperature         float64
humidity            float64
ph                  float64
rainfall            float64
ph after harvest    float64
Season               object
DIVISIONS            object
States               object
label                object
dtype: object
```

[70]:
```
crop['States'] = crop['States'].str.strip().replace({'AndhraPradesh': 'Andhra␣
↪Pradesh'})
crop['States'] = crop['States'].str.strip().replace({'JharKhand': 'Jharkhand'})
crop['States'] = crop['States'].str.strip().replace({'Madhya Pradesh':␣
↪'MadhyaPradesh'})
crop['States'] = crop['States'].str.strip().replace({'Kerala': 'Kerela'})
```

```
crop['States'] = crop['States'].str.strip().replace({'Orissa': 'Orisa'})
crop['States'] = crop['States'].str.strip().replace({'NortEast': 'NorthEast'})
crop['States'] = crop['States'].str.strip().replace({'Telangana ': 'Telengana␣
 ↪'})
crop['States'] = crop['States'].str.strip().replace({'Rajathan': 'Rajasthan'})

crop['States'] = crop['States'].str.strip().replace({'West Bengal':␣
 ↪'WestBengal'})
```

[71]:
```
crop['label'].value_counts()
```

[71]:
```
label
rice           100
maize          100
jute           100
cotton         100
coconut        100
papaya         100
orange         100
apple          100
muskmelon      100
watermelon     100
grapes         100
mango          100
banana         100
pomegranate    100
lentil         100
blackgram      100
mungbean       100
mothbeans      100
pigeonpeas     100
kidneybeans    100
chickpea       100
coffee         100
Name: count, dtype: int64
```

[72]:
```
state_counts = crop['States'].value_counts()

print(state_counts)
```

```
States
Maharashtra        213
Karnataka          175
Andhra Pradesh     169
NorthEast          162
MadhyaPradesh      141
UttarPradesh       138
```

```
TamilNadu          137
Gujarat            131
WestBengal         117
Rajasthan          112
Bihar              105
Haryana             79
Punjab              72
Orisa               71
Kerela              63
JammuKashmir        58
Chattisgarh         53
UttaraKhand         51
Orrisa              48
Telengana           39
HimachalPradesh     38
Jharkhand           19
Telangana            6
Goa                  3
Name: count, dtype: int64
```

[73]:
```
state_crop_counts = crop.groupby('States')['label'].value_counts()

print(state_crop_counts)
```

```
States           label
Andhra Pradesh   jute           20
                 mungbean       17
                 grapes         14
                 chickpea       14
                 pomegranate    13
                 pigeonpeas     12
                 papaya         12
                 rice           11
                 cotton         11
                 coconut        11
                 banana         10
                 muskmelon      10
                 watermelon      7
                 mango           7
Bihar            jute           20
                 mungbean       16
                 pigeonpeas     12
                 lentil         10
                 maize          10
                 banana         10
                 muskmelon       9
                 mango           8
                 watermelon      6
```

	rice	4
Chattisgarh	blackgram	14
	banana	10
	muskmelon	10
	lentil	10
	watermelon	6
	rice	3
Goa	rice	3
Gujarat	mungbean	17
	mothbeans	14
	chickpea	14
	pomegranate	13
	pigeonpeas	12
	coconut	11
	cotton	11
	papaya	11
	maize	10
	banana	10
	mango	8
Haryana	mothbeans	14
	grapes	14
	pomegranate	12
	cotton	11
	muskmelon	10
	mango	8
	watermelon	7
	rice	3
HimachalPradesh	apple	25
	mango	8
	rice	4
	muskmelon	1
JammuKashmir	apple	25
	kidneybeans	13
	maize	10
	watermelon	6
	rice	3
	muskmelon	1
Jharkhand	lentil	10
	watermelon	6
	rice	3
Karnataka	coffee	25
	grapes	15
	chickpea	14
	mothbeans	14
	pomegranate	13
	pigeonpeas	12
	kidneybeans	12
	coconut	12

	papaya	11
	banana	10
	maize	10
	muskmelon	9
	mango	8
	watermelon	7
	rice	3
Kerela	coffee	25
	kidneybeans	12
	coconut	11
	papaya	11
	rice	4
MadhyaPradesh	orange	17
	mothbeans	15
	chickpea	15
	blackgram	15
	pigeonpeas	13
	papaya	11
	cotton	11
	maize	10
	lentil	10
	muskmelon	10
	watermelon	7
	mango	7
Maharashtra	orange	17
	mungbean	17
	chickpea	15
	grapes	15
	blackgram	15
	mothbeans	14
	pigeonpeas	13
	kidneybeans	13
	pomegranate	12
	cotton	11
	papaya	11
	coconut	11
	banana	10
	muskmelon	10
	maize	10
	mango	8
	watermelon	7
	rice	4
NorthEast	coffee	25
	apple	25
	jute	20
	orange	17
	grapes	14
	rice	12

	coconut	11
	papaya	11
	lentil	10
	banana	10
	watermelon	7
Orisa	jute	20
	orange	17
	rice	12
	papaya	11
	coconut	11
Orrisa	mungbean	17
	blackgram	14
	lentil	10
	watermelon	7
Punjab	grapes	14
	kidneybeans	13
	pomegranate	12
	cotton	12
	muskmelon	10
	mango	7
	rice	4
Rajasthan	orange	16
	mungbean	16
	chickpea	14
	blackgram	14
	mothbeans	14
	cotton	11
	lentil	10
	maize	10
	mango	7
TamilNadu	coffee	25
	grapes	14
	pigeonpeas	13
	pomegranate	13
	kidneybeans	12
	coconut	11
	banana	10
	maize	10
	muskmelon	10
	mango	8
	watermelon	7
	rice	4
Telangana	watermelon	6
Telengana	blackgram	14
	cotton	11
	maize	10
	rice	4
UttarPradesh	mothbeans	15

```
                  blackgram      14
                  chickpea       14
                  pigeonpeas     13
                  pomegranate    12
                  cotton         11
                  banana         10
                  muskmelon      10
                  maize          10
                  lentil         10
                  mango           8
                  watermelon      7
                  rice            4
UttaraKhand       apple          25
                  kidneybeans    13
                  lentil         10
                  rice            3
WestBengal        jute           20
                  orange         16
                  kidneybeans    12
                  rice           12
                  coconut        11
                  papaya         11
                  lentil         10
                  banana         10
                  mango           8
                  watermelon      7
Name: count, dtype: int64
```

[74]:
```
state_crop_division_season_counts = crop.groupby(['States', 'label',␣
↪'DIVISIONS', 'Season ']).size().reset_index(name='counts')

print(state_crop_division_season_counts)
```

```
              States        label  DIVISIONS     Season   counts
0     Andhra Pradesh       banana     Fruits  Perennial       10
1     Andhra Pradesh     chickpea     pulses       Rabi       14
2     Andhra Pradesh      coconut  cashcrops  Perennial       11
3     Andhra Pradesh       cotton  cashcrops     Kharif       11
4     Andhra Pradesh       grapes     Fruits       Rabi       14
5     Andhra Pradesh         jute  cashcrops     Kharif       20
6     Andhra Pradesh        mango     Fruits  Perennial        7
7     Andhra Pradesh     mungbean     pulses     Kharif       17
8     Andhra Pradesh    muskmelon     Fruits     Kharif       10
9     Andhra Pradesh       papaya     Fruits  Perennial       12
10    Andhra Pradesh   pigeonpeas     pulses     Kharif       12
11    Andhra Pradesh  pomegranate     Fruits  Perennial       13
12    Andhra Pradesh         rice    cereals    Kharif        3
13    Andhra Pradesh         rice    cereals       Rabi        8
```

14	Andhra Pradesh	watermelon	Fruits	Kharif	7
15	Bihar	banana	Fruits	Perennial	10
16	Bihar	jute	cashcrops	Kharif	20
17	Bihar	lentil	pulses	Rabi	10
18	Bihar	maize	cereals	Kharif	10
19	Bihar	mango	Fruits	Perennial	8
20	Bihar	mungbean	pulses	Kharif	16
21	Bihar	muskmelon	Fruits	Kharif	9
22	Bihar	pigeonpeas	pulses	Kharif	12
23	Bihar	rice	cereals	Kharif	4
24	Bihar	watermelon	Fruits	Kharif	6
25	Chattisgarh	banana	Fruits	Perennial	10
26	Chattisgarh	blackgram	pulses	Kharif	14
27	Chattisgarh	lentil	pulses	Rabi	10
28	Chattisgarh	muskmelon	Fruits	Kharif	10
29	Chattisgarh	rice	cereals	Kharif	3
30	Chattisgarh	watermelon	Fruits	Kharif	6
31	Goa	rice	cereals	Kharif	3
32	Gujarat	banana	Fruits	Perennial	10
33	Gujarat	chickpea	pulses	Rabi	14
34	Gujarat	coconut	cashcrops	Perennial	11
35	Gujarat	cotton	cashcrops	Kharif	11
36	Gujarat	maize	cereals	Kharif	10
37	Gujarat	mango	Fruits	Perennial	8
38	Gujarat	mothbeans	pulses	Kharif	14
39	Gujarat	mungbean	pulses	Kharif	17
40	Gujarat	papaya	Fruits	Perennial	11
41	Gujarat	pigeonpeas	pulses	Kharif	12
42	Gujarat	pomegranate	Fruits	Perennial	13
43	Haryana	cotton	cashcrops	Kharif	11
44	Haryana	grapes	Fruits	Rabi	14
45	Haryana	mango	Fruits	Perennial	8
46	Haryana	mothbeans	pulses	Kharif	14
47	Haryana	muskmelon	Fruits	Kharif	10
48	Haryana	pomegranate	Fruits	Perennial	12
49	Haryana	rice	cereals	Kharif	3
50	Haryana	watermelon	Fruits	Kharif	7
51	HimachalPradesh	apple	Fruits	Rabi	25
52	HimachalPradesh	mango	Fruits	Perennial	8
53	HimachalPradesh	muskmelon	Fruits	Kharif	1
54	HimachalPradesh	rice	cereals	Kharif	4
55	JammuKashmir	apple	Fruits	Rabi	25
56	JammuKashmir	kidneybeans	pulses	Kharif	13
57	JammuKashmir	maize	cereals	Kharif	10
58	JammuKashmir	muskmelon	Fruits	Kharif	1
59	JammuKashmir	rice	cereals	Kharif	3
60	JammuKashmir	watermelon	Fruits	Kharif	6
61	Jharkhand	lentil	pulses	Rabi	10

62	Jharkhand	rice	cereals	Kharif	3
63	Jharkhand	watermelon	Fruits	Kharif	6
64	Karnataka	banana	Fruits	Perennial	10
65	Karnataka	chickpea	pulses	Rabi	14
66	Karnataka	coconut	cashcrops	Perennial	12
67	Karnataka	coffee	cashcrops	Perennial	25
68	Karnataka	grapes	Fruits	Rabi	15
69	Karnataka	kidneybeans	pulses	Kharif	12
70	Karnataka	maize	cereals	Kharif	10
71	Karnataka	mango	Fruits	Perennial	8
72	Karnataka	mothbeans	pulses	Kharif	14
73	Karnataka	muskmelon	Fruits	Kharif	9
74	Karnataka	papaya	Fruits	Perennial	11
75	Karnataka	pigeonpeas	pulses	Kharif	12
76	Karnataka	pomegranate	Fruits	Perennial	13
77	Karnataka	rice	cereals	Kharif	3
78	Karnataka	watermelon	Fruits	Kharif	7
79	Kerela	coconut	cashcrops	Perennial	11
80	Kerela	coffee	cashcrops	Perennial	25
81	Kerela	kidneybeans	pulses	Kharif	12
82	Kerela	papaya	Fruits	Perennial	11
83	Kerela	rice	cereals	Kharif	4
84	MadhyaPradesh	blackgram	pulses	Kharif	15
85	MadhyaPradesh	chickpea	pulses	Rabi	15
86	MadhyaPradesh	cotton	cashcrops	Kharif	11
87	MadhyaPradesh	lentil	pulses	Rabi	10
88	MadhyaPradesh	maize	cereals	Kharif	10
89	MadhyaPradesh	mango	Fruits	Perennial	7
90	MadhyaPradesh	mothbeans	pulses	Kharif	15
91	MadhyaPradesh	muskmelon	Fruits	Kharif	10
92	MadhyaPradesh	orange	Fruits	Rabi	17
93	MadhyaPradesh	papaya	Fruits	Perennial	11
94	MadhyaPradesh	pigeonpeas	pulses	Kharif	13
95	MadhyaPradesh	watermelon	Fruits	Kharif	7
96	Maharashtra	banana	Fruits	Perennial	10
97	Maharashtra	blackgram	pulses	Kharif	15
98	Maharashtra	chickpea	pulses	Rabi	15
99	Maharashtra	coconut	cashcrops	Perennial	11
100	Maharashtra	cotton	cashcrops	Kharif	11
101	Maharashtra	grapes	Fruits	Rabi	15
102	Maharashtra	kidneybeans	pulses	Kharif	13
103	Maharashtra	maize	cereals	Kharif	10
104	Maharashtra	mango	Fruits	Perennial	8
105	Maharashtra	mothbeans	pulses	Kharif	14
106	Maharashtra	mungbean	pulses	Kharif	17
107	Maharashtra	muskmelon	Fruits	Kharif	10
108	Maharashtra	orange	Fruits	Rabi	17
109	Maharashtra	papaya	Fruits	Perennial	11

110	Maharashtra	pigeonpeas	pulses	Kharif	13
111	Maharashtra	pomegranate	Fruits	Perennial	12
112	Maharashtra	rice	cereals	Kharif	4
113	Maharashtra	watermelon	Fruits	Kharif	7
114	NorthEast	apple	Fruits	Rabi	25
115	NorthEast	banana	Fruits	Perennial	10
116	NorthEast	coconut	cashcrops	Perennial	11
117	NorthEast	coffee	cashcrops	Perennial	25
118	NorthEast	grapes	Fruits	Rabi	14
119	NorthEast	jute	cashcrops	Kharif	20
120	NorthEast	lentil	pulses	Rabi	10
121	NorthEast	orange	Fruits	Rabi	17
122	NorthEast	papaya	Fruits	Perennial	11
123	NorthEast	rice	cereals	Kharif	4
124	NorthEast	rice	cereals	Rabi	8
125	NorthEast	watermelon	Fruits	Kharif	7
126	Orisa	coconut	cashcrops	Perennial	11
127	Orisa	jute	cashcrops	Kharif	20
128	Orisa	orange	Fruits	Rabi	17
129	Orisa	papaya	Fruits	Perennial	11
130	Orisa	rice	cereals	Kharif	4
131	Orisa	rice	cereals	Rabi	8
132	Orrisa	blackgram	pulses	Kharif	14
133	Orrisa	lentil	pulses	Rabi	10
134	Orrisa	mungbean	pulses	Kharif	17
135	Orrisa	watermelon	Fruits	Kharif	7
136	Punjab	cotton	cashcrops	Kharif	12
137	Punjab	grapes	Fruits	Rabi	14
138	Punjab	kidneybeans	pulses	Kharif	13
139	Punjab	mango	Fruits	Perennial	7
140	Punjab	muskmelon	Fruits	Kharif	10
141	Punjab	pomegranate	Fruits	Perennial	12
142	Punjab	rice	cereals	Kharif	4
143	Rajasthan	blackgram	pulses	Kharif	14
144	Rajasthan	chickpea	pulses	Rabi	14
145	Rajasthan	cotton	cashcrops	Kharif	11
146	Rajasthan	lentil	pulses	Rabi	10
147	Rajasthan	maize	cereals	Kharif	10
148	Rajasthan	mango	Fruits	Perennial	7
149	Rajasthan	mothbeans	pulses	Kharif	14
150	Rajasthan	mungbean	pulses	Kharif	16
151	Rajasthan	orange	Fruits	Rabi	16
152	TamilNadu	banana	Fruits	Perennial	10
153	TamilNadu	coconut	cashcrops	Perennial	11
154	TamilNadu	coffee	cashcrops	Perennial	25
155	TamilNadu	grapes	Fruits	Rabi	14
156	TamilNadu	kidneybeans	pulses	Kharif	12
157	TamilNadu	maize	cereals	Kharif	10

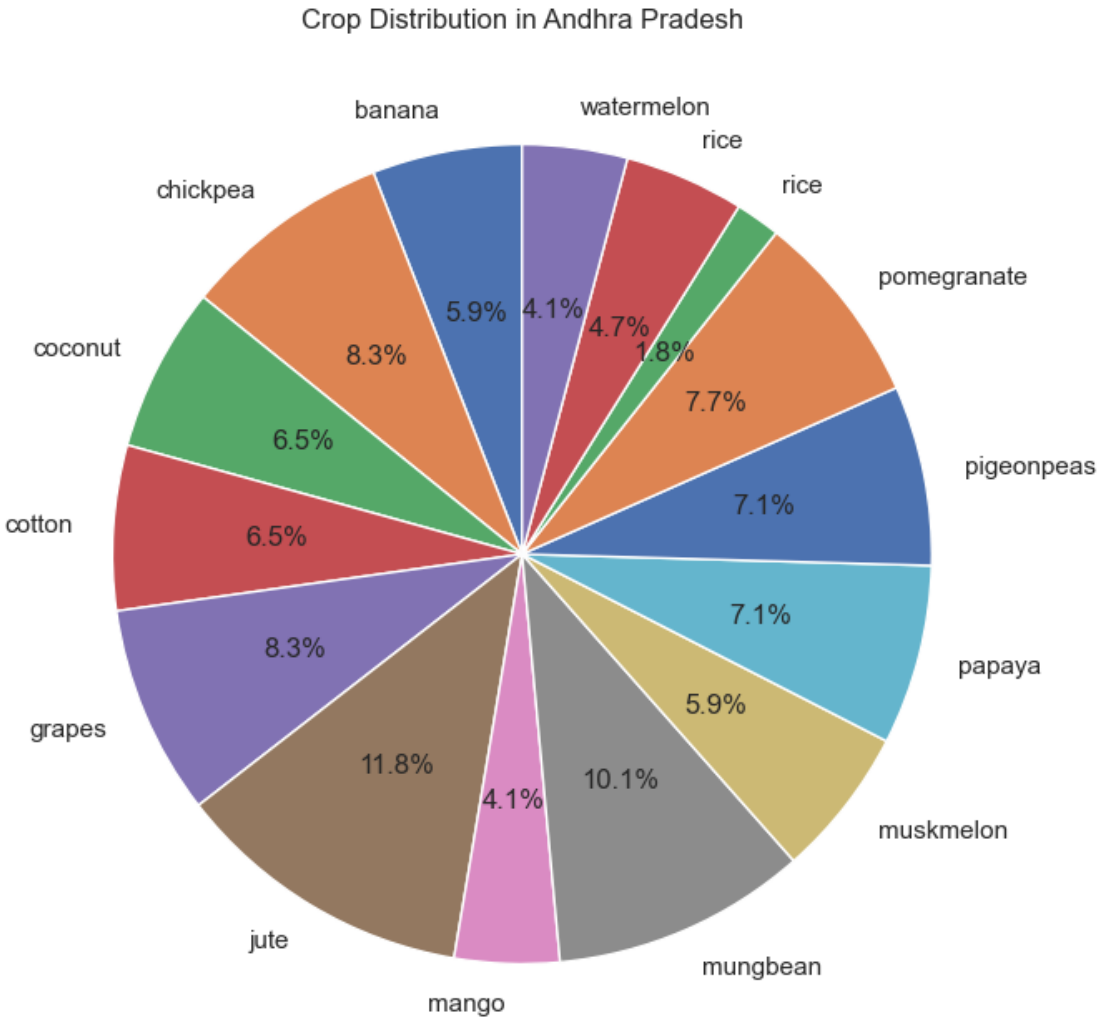
158	TamilNadu	mango	Fruits	Perennial	8
159	TamilNadu	muskmelon	Fruits	Kharif	10
160	TamilNadu	pigeonpeas	pulses	Kharif	13
161	TamilNadu	pomegranate	Fruits	Perennial	13
162	TamilNadu	rice	cereals	Kharif	4
163	TamilNadu	watermelon	Fruits	Kharif	7
164	Telangana	watermelon	Fruits	Kharif	6
165	Telengana	blackgram	pulses	Kharif	14
166	Telengana	cotton	cashcrops	Kharif	11
167	Telengana	maize	cereals	Kharif	10
168	Telengana	rice	cereals	Kharif	3
169	Telengana	rice	cereals	Rabi	1
170	UttarPradesh	banana	Fruits	Perennial	10
171	UttarPradesh	blackgram	pulses	Kharif	14
172	UttarPradesh	chickpea	pulses	Rabi	14
173	UttarPradesh	cotton	cashcrops	Kharif	11
174	UttarPradesh	lentil	pulses	Rabi	10
175	UttarPradesh	maize	cereals	Kharif	10
176	UttarPradesh	mango	Fruits	Perennial	8
177	UttarPradesh	mothbeans	pulses	Kharif	15
178	UttarPradesh	muskmelon	Fruits	Kharif	10
179	UttarPradesh	pigeonpeas	pulses	Kharif	13
180	UttarPradesh	pomegranate	Fruits	Perennial	12
181	UttarPradesh	rice	cereals	Kharif	4
182	UttarPradesh	watermelon	Fruits	Kharif	7
183	UttaraKhand	apple	Fruits	Rabi	25
184	UttaraKhand	kidneybeans	pulses	Kharif	13
185	UttaraKhand	lentil	pulses	Rabi	10
186	UttaraKhand	rice	cereals	Kharif	3
187	WestBengal	banana	Fruits	Perennial	10
188	WestBengal	coconut	cashcrops	Perennial	11
189	WestBengal	jute	cashcrops	Kharif	20
190	WestBengal	kidneybeans	pulses	Kharif	12
191	WestBengal	lentil	pulses	Rabi	10
192	WestBengal	mango	Fruits	Perennial	8
193	WestBengal	orange	Fruits	Rabi	16
194	WestBengal	papaya	Fruits	Perennial	11
195	WestBengal	rice	cereals	Kharif	4
196	WestBengal	rice	cereals	Rabi	8
197	WestBengal	watermelon	Fruits	Kharif	7

[75]:
```
sns.set_theme()
```

Pie Chart for Crop Distribution

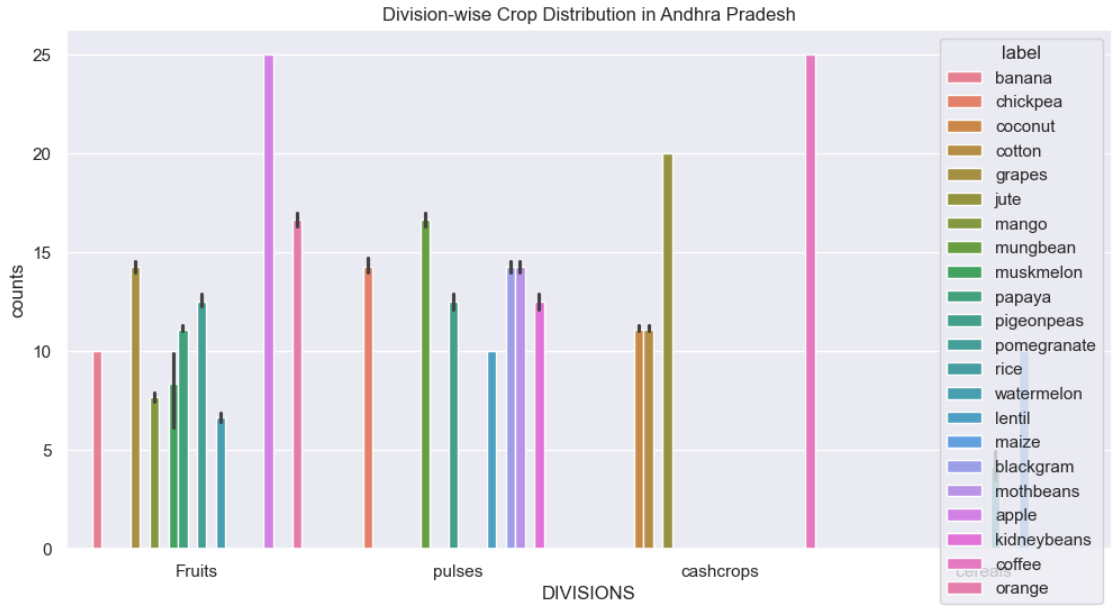
[88]:
```
andhra_crop_distribution =␣
↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
↪== 'Andhra Pradesh']
```

```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Andhra Pradesh')
plt.pie(andhra_crop_distribution['counts'],␣
 ↪labels=andhra_crop_distribution['label'], autopct='%1.1f%%', startangle=90)
plt.show()
```



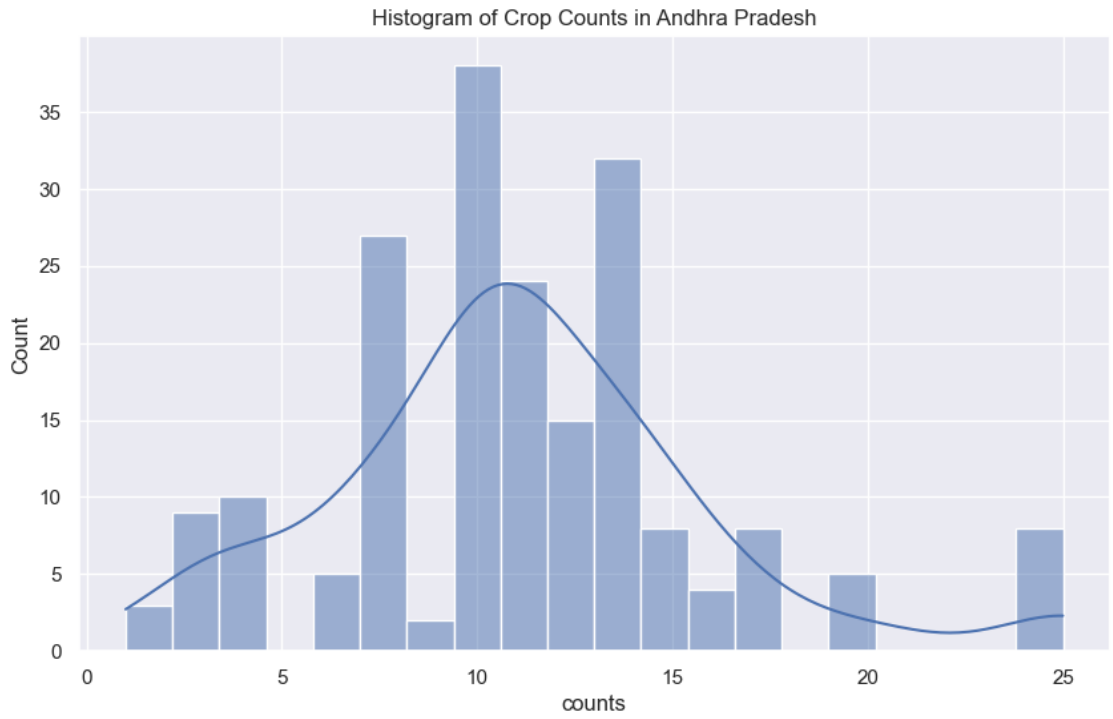
Bar Chart for Division-wise Crop Distribution

[80]:
```
plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Andhra Pradesh')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=state_crop_division_season_counts)
plt.show()
```



Histogram for Crop Counts

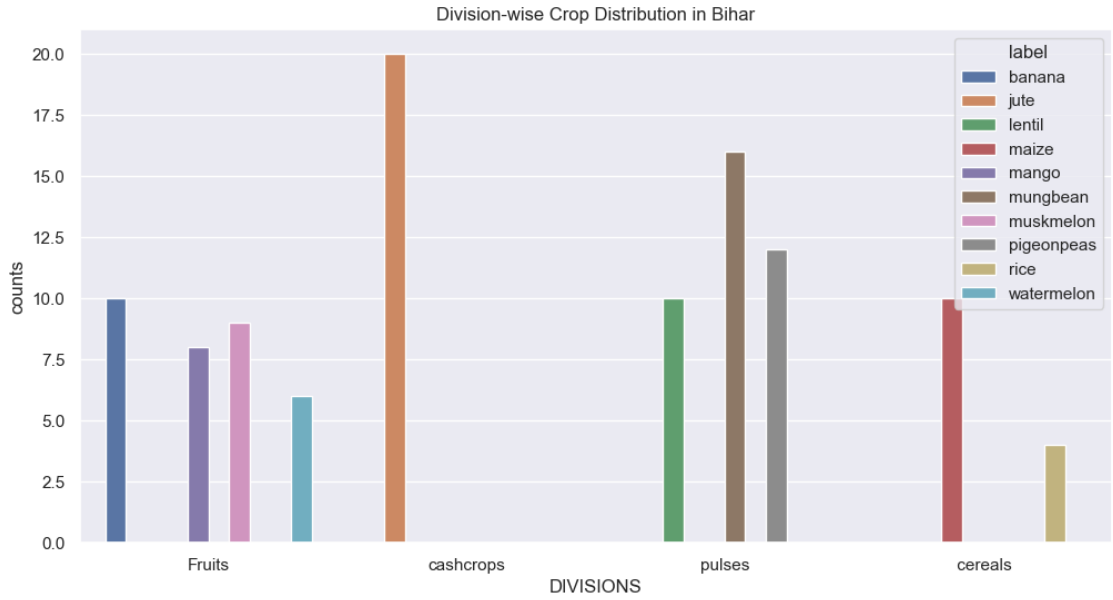
[81]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Andhra Pradesh')
sns.histplot(state_crop_division_season_counts['counts'], bins=20, kde=True)
plt.show()
```



BIHAR

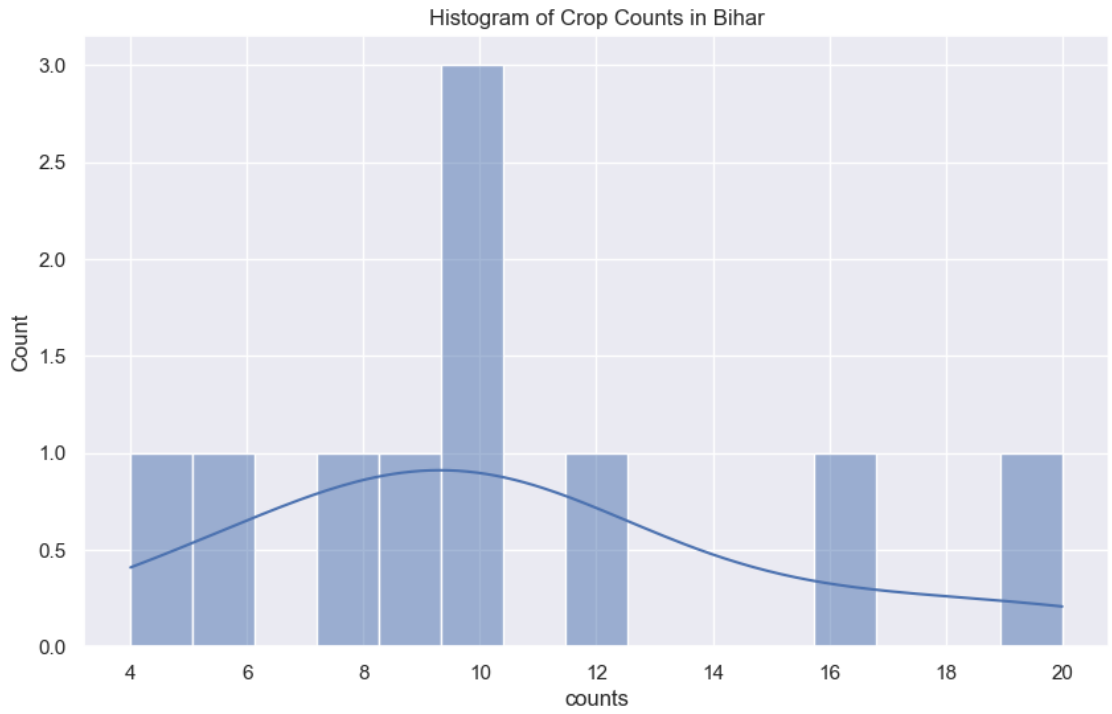
Bar Chart for Crop Distribution by Division

[83]:
```
plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Bihar')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'Bihar'])
plt.show()
```



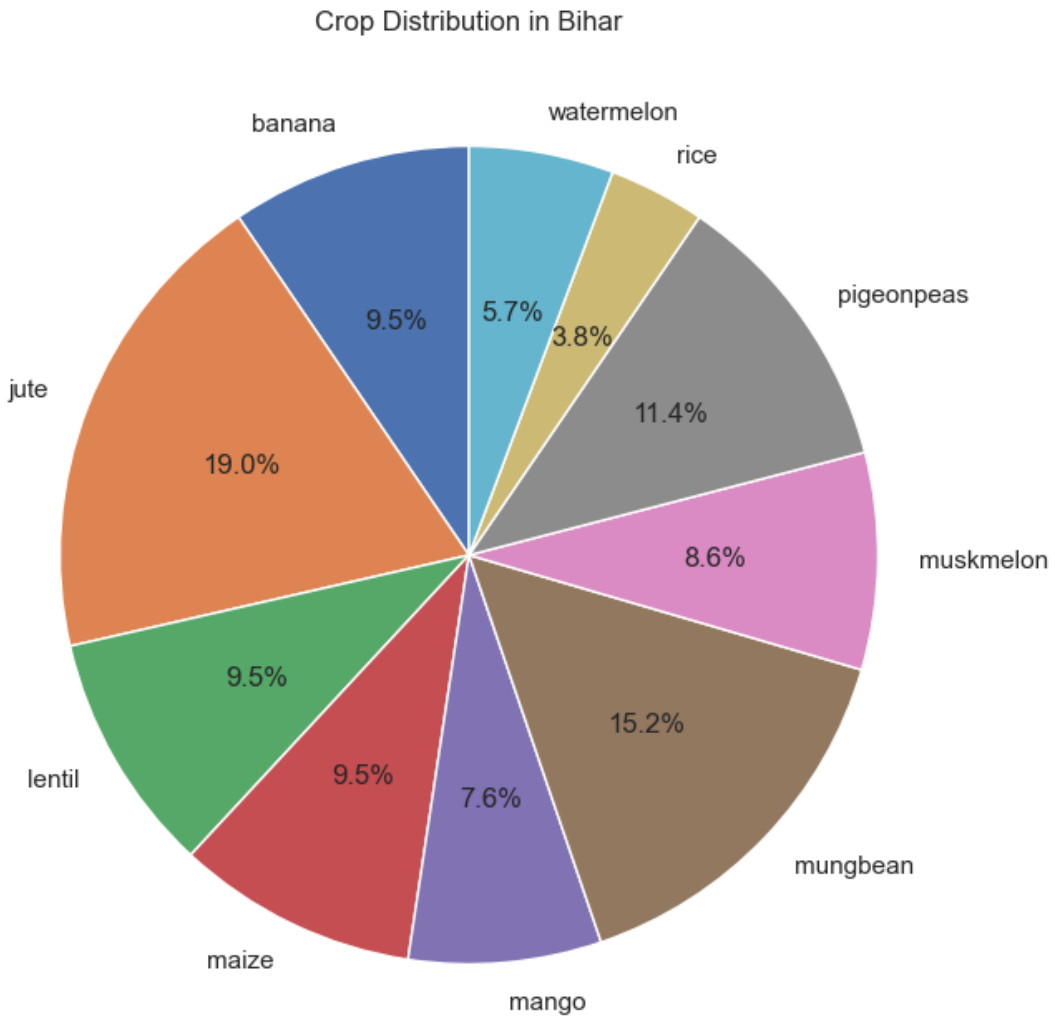
Histogram for Crop Counts in Bihar

[84]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Bihar')
sns.
 ↪histplot(state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'Bihar']['counts'], bins=15, kde=True)
plt.show()
```



Pie

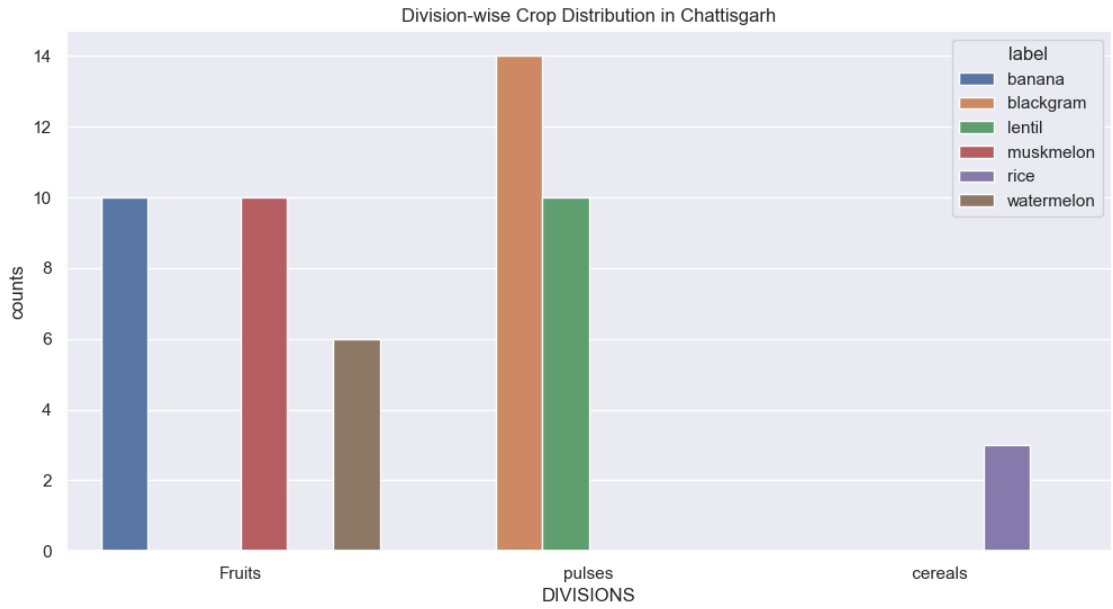
[86]:
```
bihar_crop_distribution = ␣
  ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
  ↪== 'Bihar']

plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Bihar')
plt.pie(bihar_crop_distribution['counts'],␣
  ↪labels=bihar_crop_distribution['label'], autopct='%1.1f%%', startangle=90)
plt.show()
```



Chattisgarh

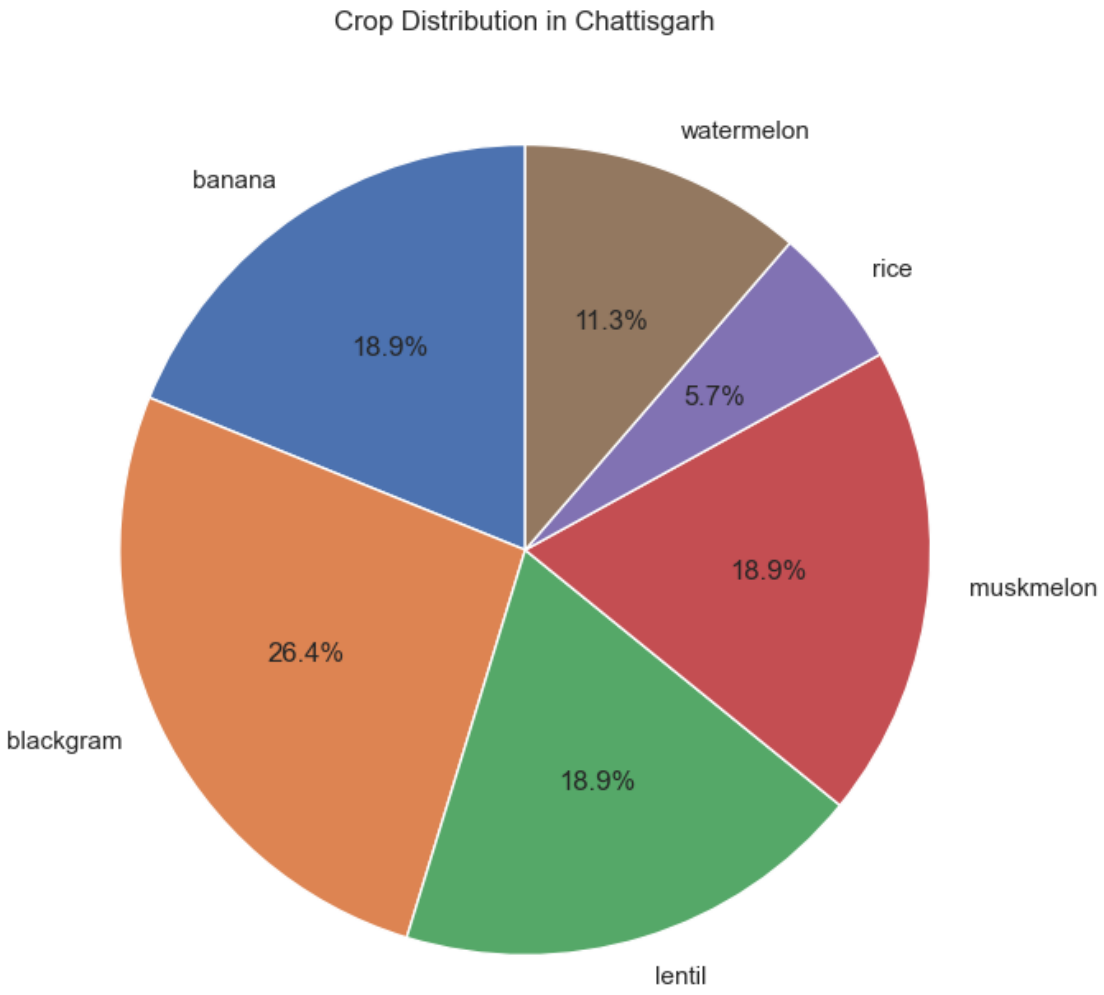
Bar Chart for Crop Distribution by Division

[89]:
```
chattisgarh_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'Chattisgarh']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Chattisgarh')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=chattisgarh_crop_distribution)
plt.show()
```



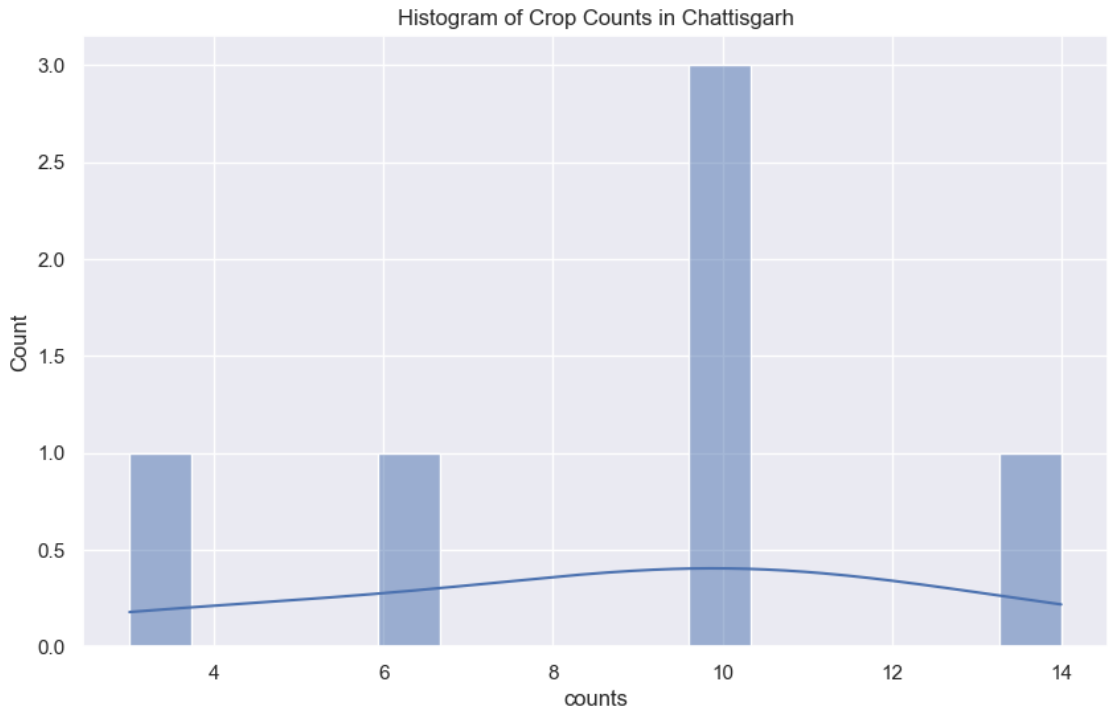
Pie Chart for Crop Distribution

[90]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Chattisgarh')
plt.pie(chattisgarh_crop_distribution['counts'],␣
 ↪labels=chattisgarh_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in Chattisgarh

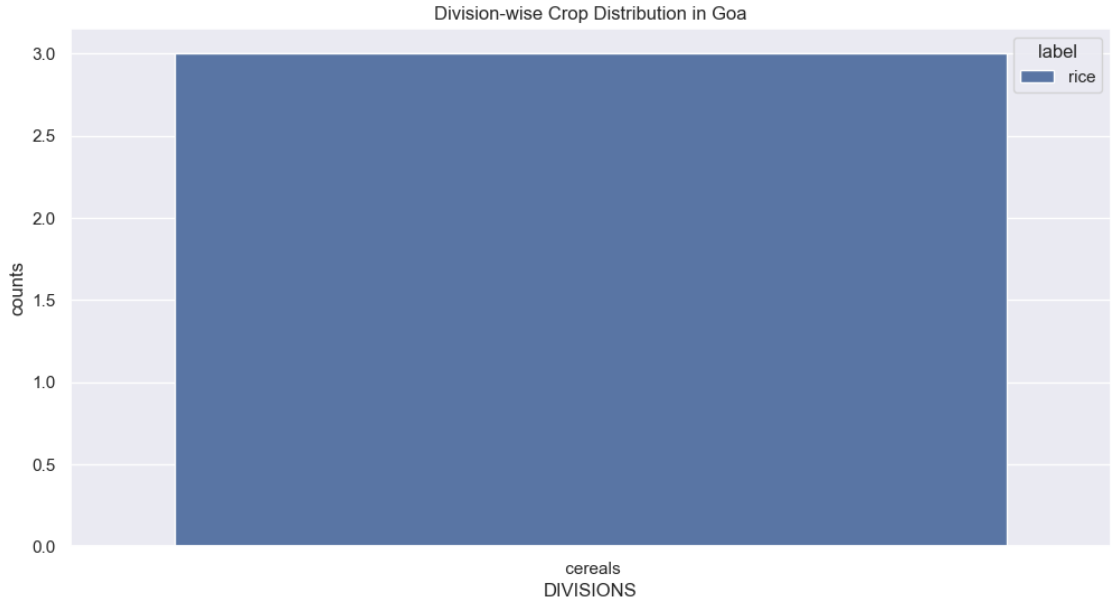
[91]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Chattisgarh')
sns.histplot(chattisgarh_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



Goa

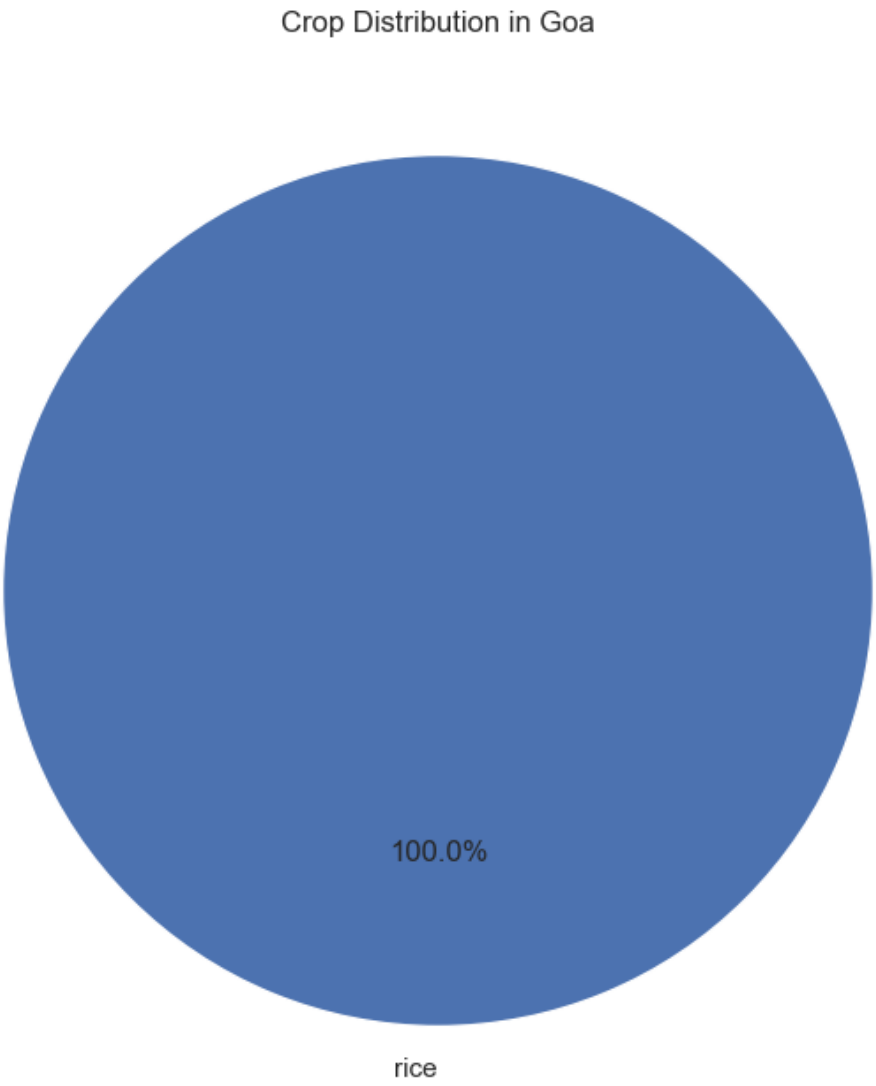
Bar Chart for Crop Distribution by Division

[94]:
```
goa_crop_distribution =␣
  ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
  ↪== 'Goa']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Goa')
sns.barplot(x='DIVISIONS', y='counts', hue='label', data=goa_crop_distribution)
plt.show()
```



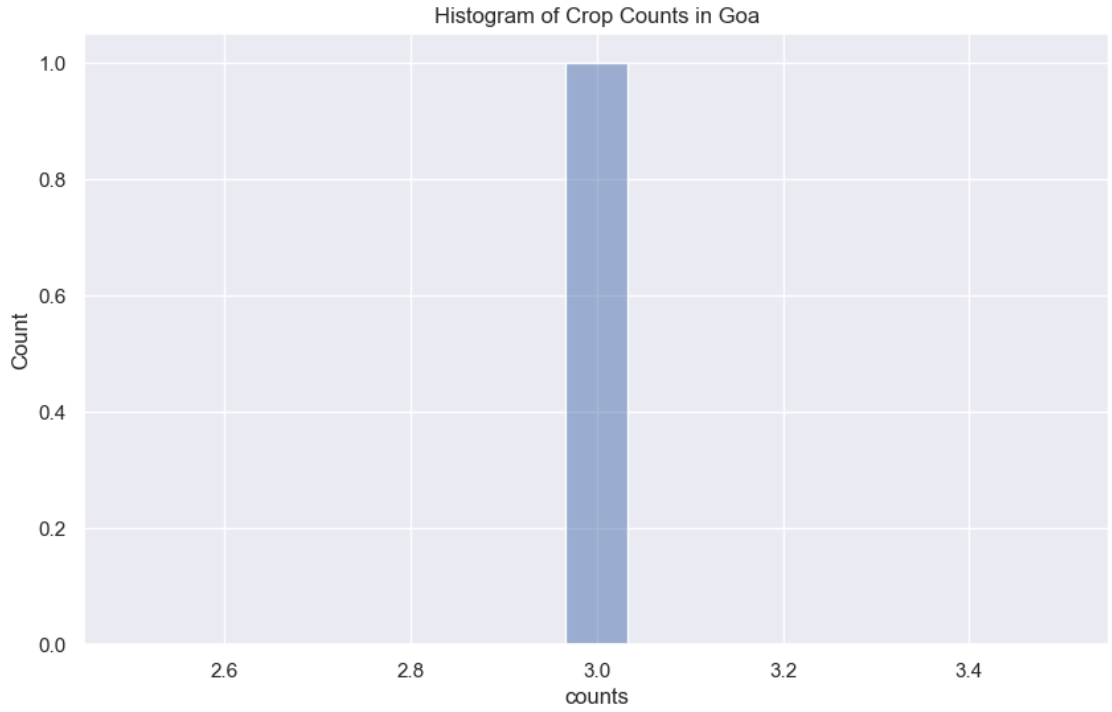
Pie Chart for Crop Distribution

[95]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Goa')
plt.pie(goa_crop_distribution['counts'], labels=goa_crop_distribution['label'],␣
 ↪autopct='%1.1f%%', startangle=90)
plt.show()
```



Histogram for Crop Counts in Goa

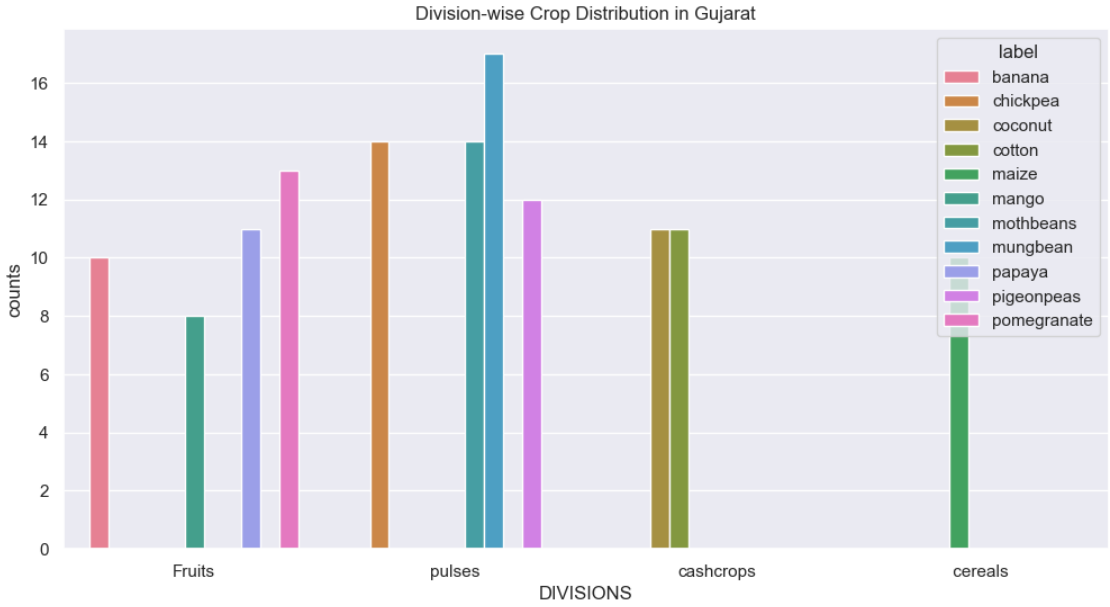
[96]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Goa')
sns.histplot(goa_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



Gujrat

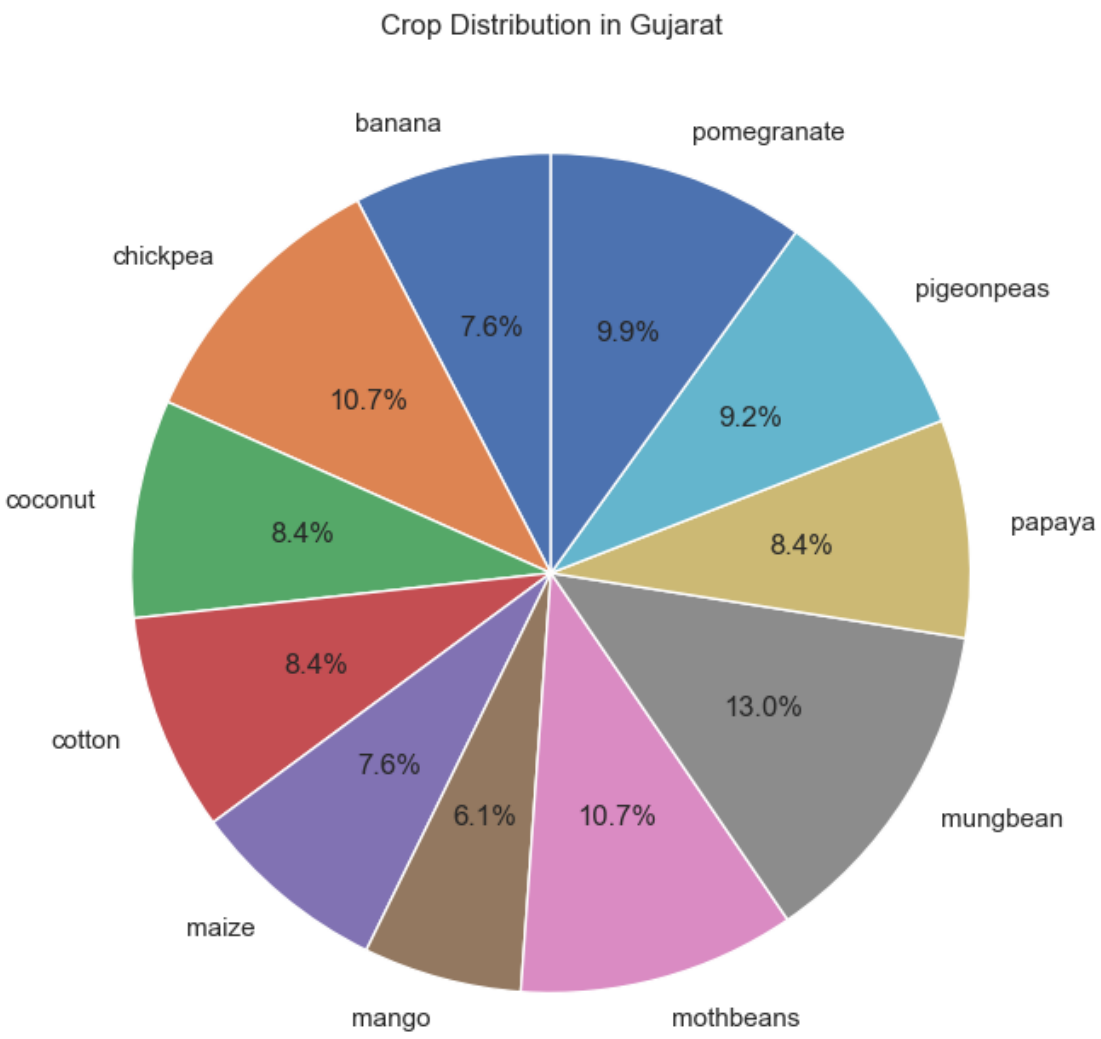
Bar Chart for Crop Distribution by Division

[97]:
```
gujarat_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'Gujarat']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Gujarat')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=gujarat_crop_distribution)
plt.show()
```



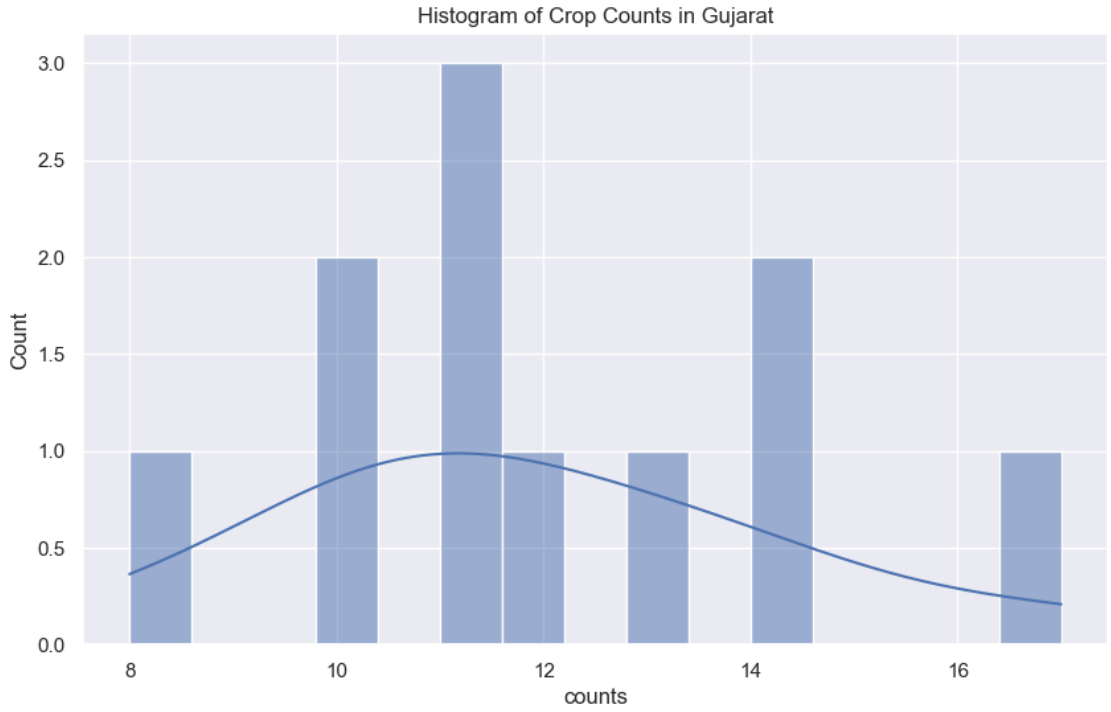
Pie Chart for Crop Distribution

[98]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Gujarat')
plt.pie(gujarat_crop_distribution['counts'],␣
 ↪labels=gujarat_crop_distribution['label'], autopct='%1.1f%%', startangle=90)
plt.show()
```



Histogram for Crop Counts in Gujarat

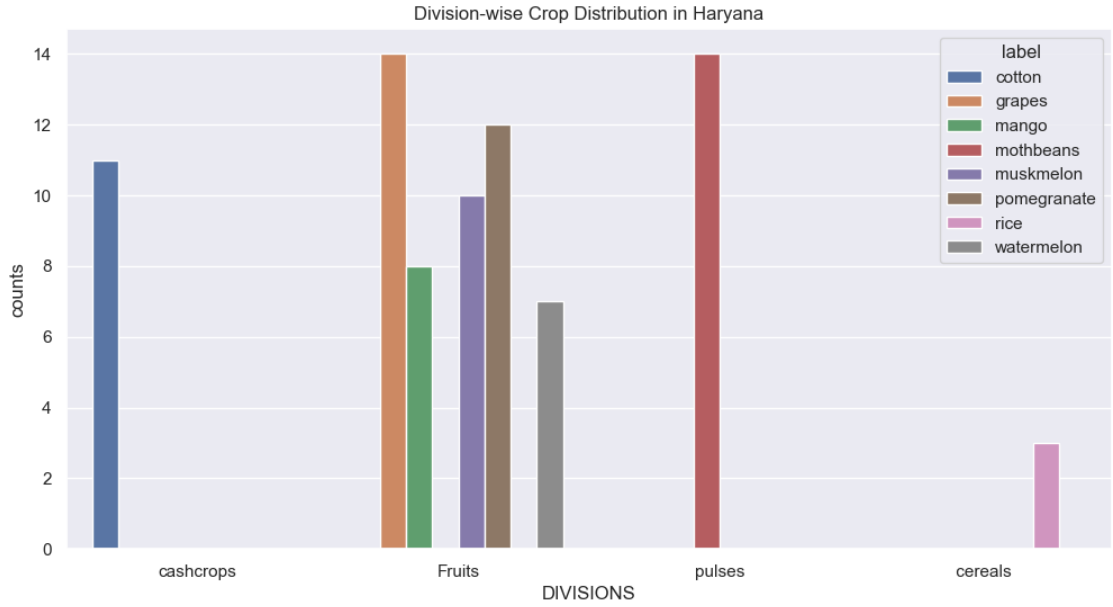
[100]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Gujarat')
sns.histplot(gujarat_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



Haryana

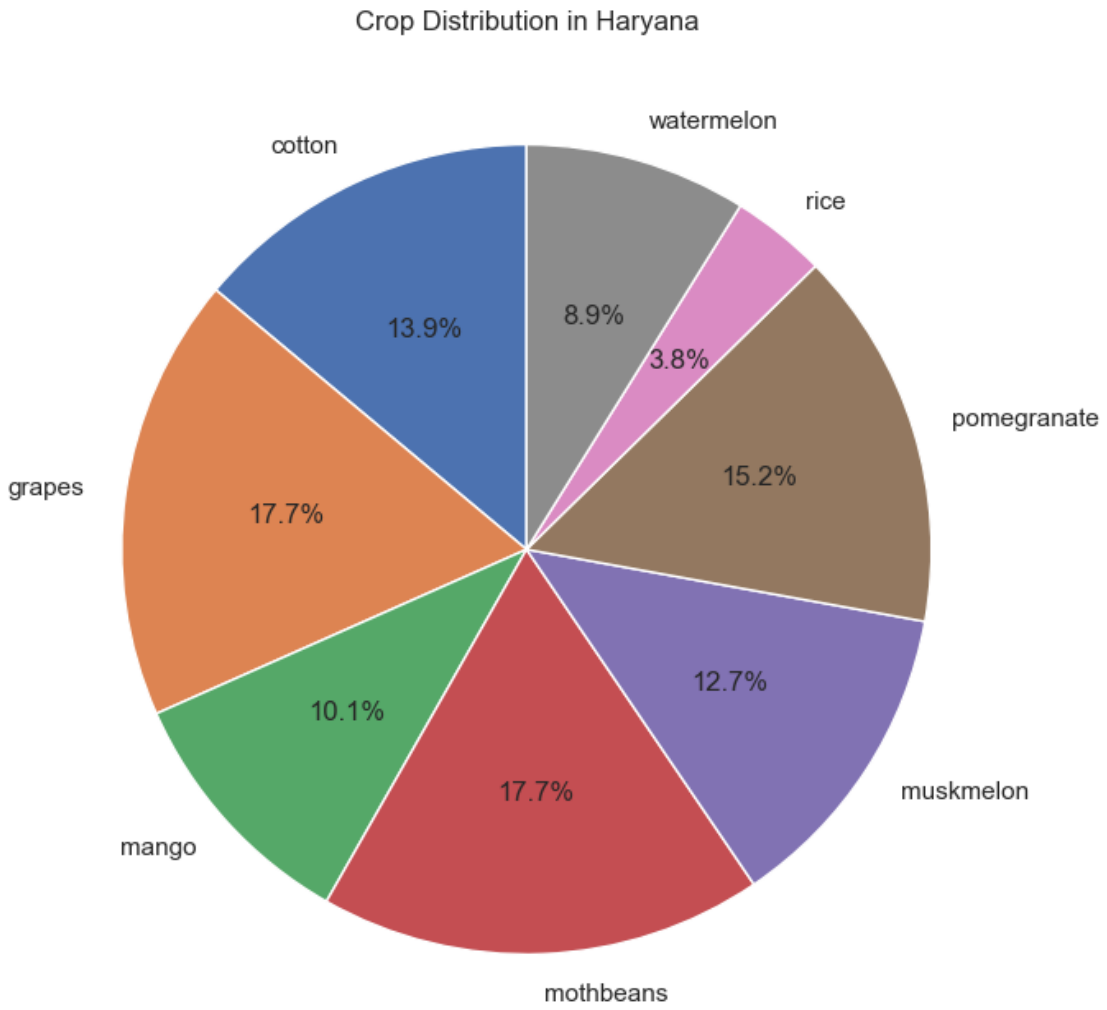
Bar Chart for Crop Distribution by Division

[101]:
```
haryana_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'Haryana']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Haryana')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=haryana_crop_distribution)
plt.show()
```



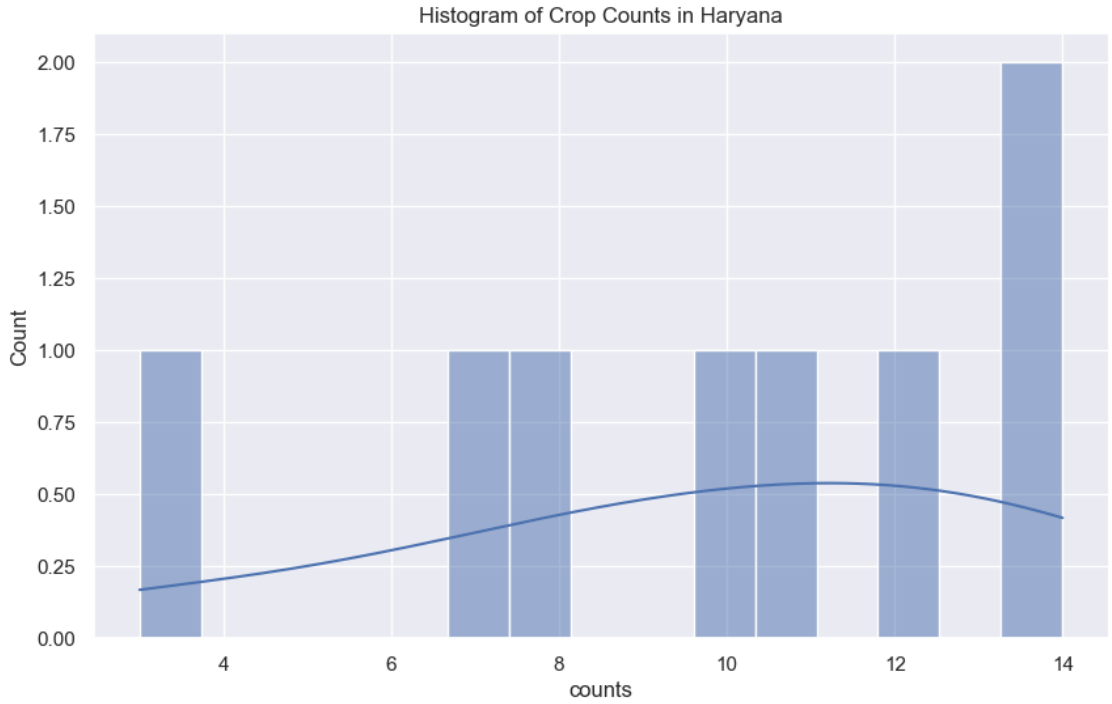
Pie Chart for Crop Distribution

[102]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Haryana')
plt.pie(haryana_crop_distribution['counts'],␣
 ↪labels=haryana_crop_distribution['label'], autopct='%1.1f%%', startangle=90)
plt.show()
```



Histogram for Crop Counts in Haryana

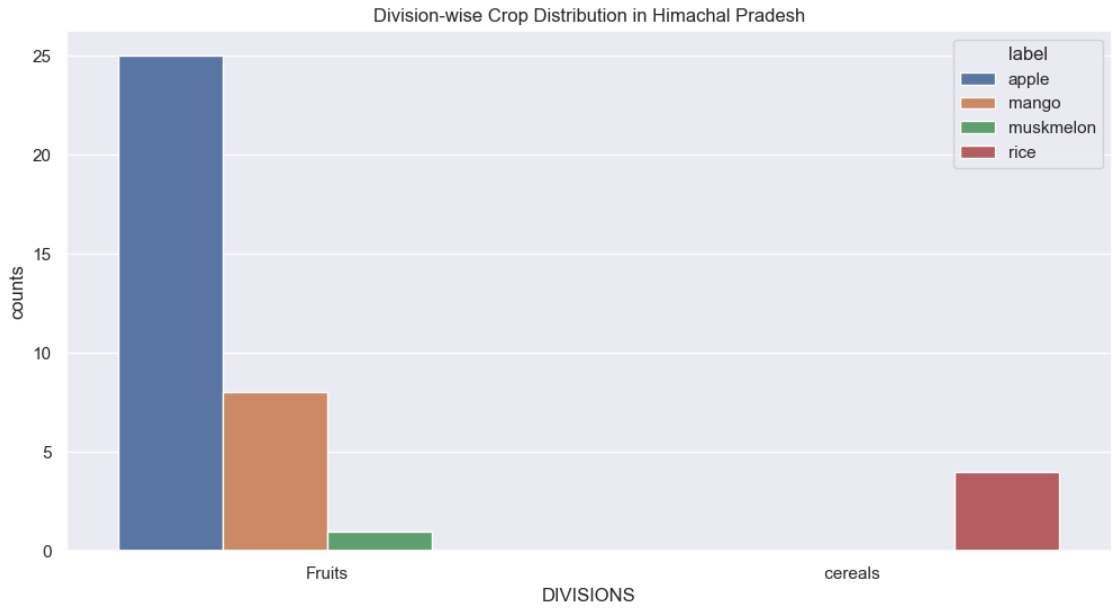
[103]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Haryana')
sns.histplot(haryana_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



HimachalPradesh

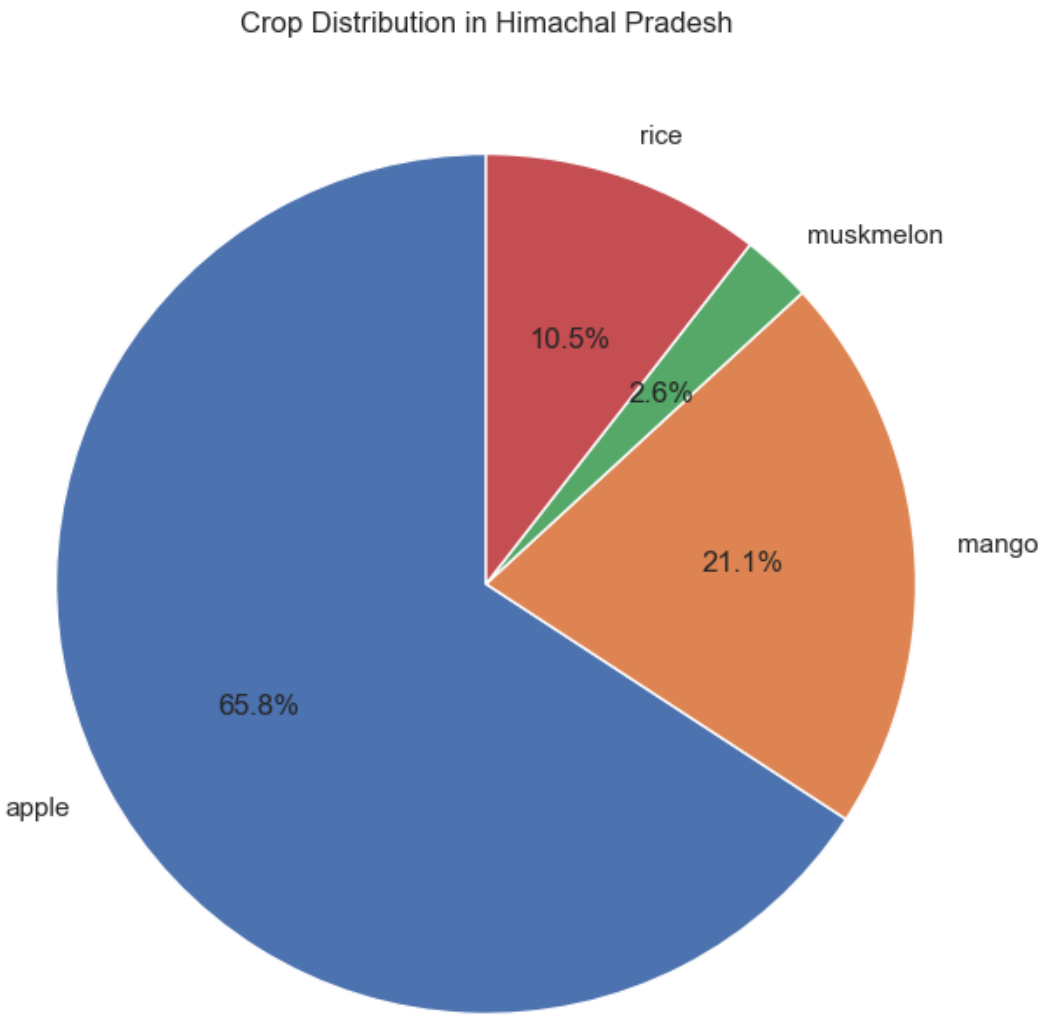
Bar Chart for Crop Distribution by Division

[104]:
```
himachal_pradesh_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'HimachalPradesh']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Himachal Pradesh')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=himachal_pradesh_crop_distribution)
plt.show()
```



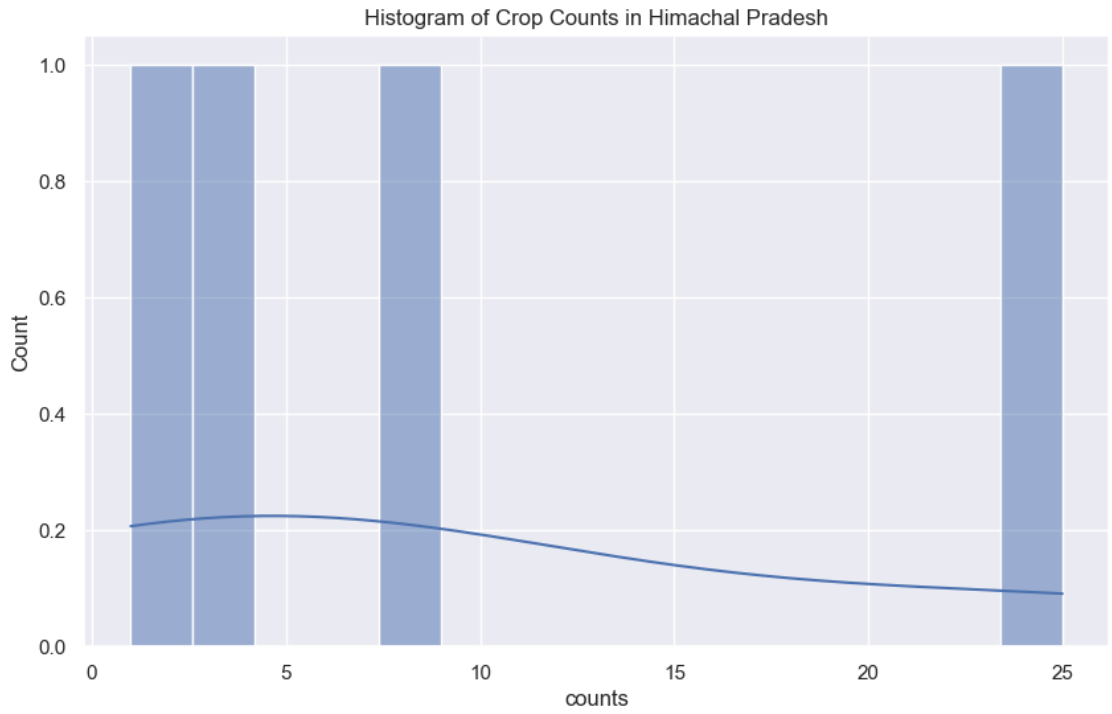
Pie Chart for Crop Distribution

[105]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Himachal Pradesh')
plt.pie(himachal_pradesh_crop_distribution['counts'],␣
 ↪labels=himachal_pradesh_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in Himachal Pradesh

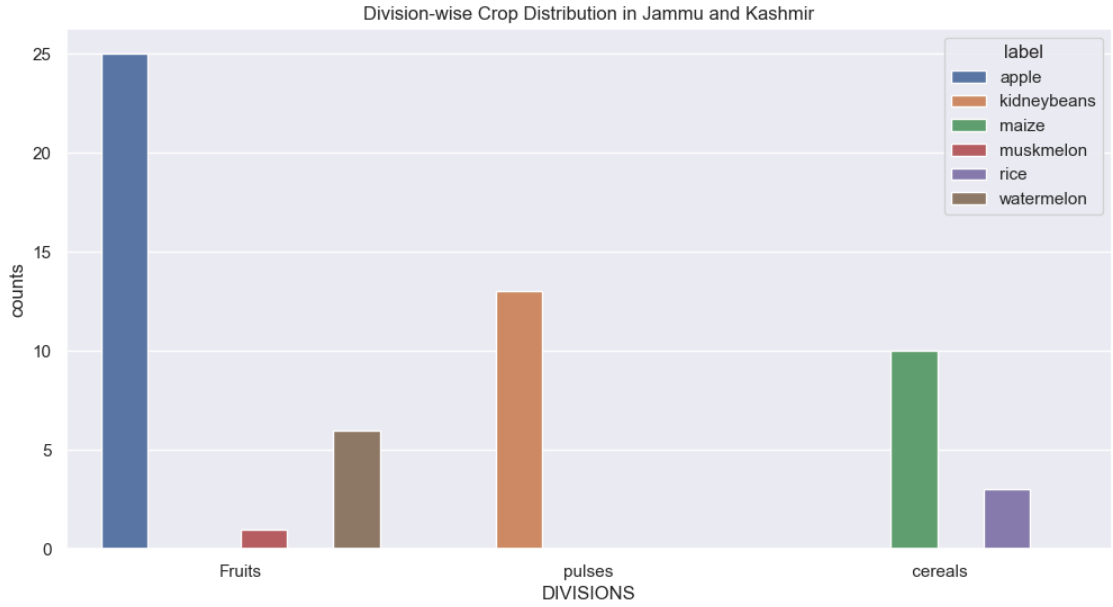
[106]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Himachal Pradesh')
sns.histplot(himachal_pradesh_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



JammuKashmir

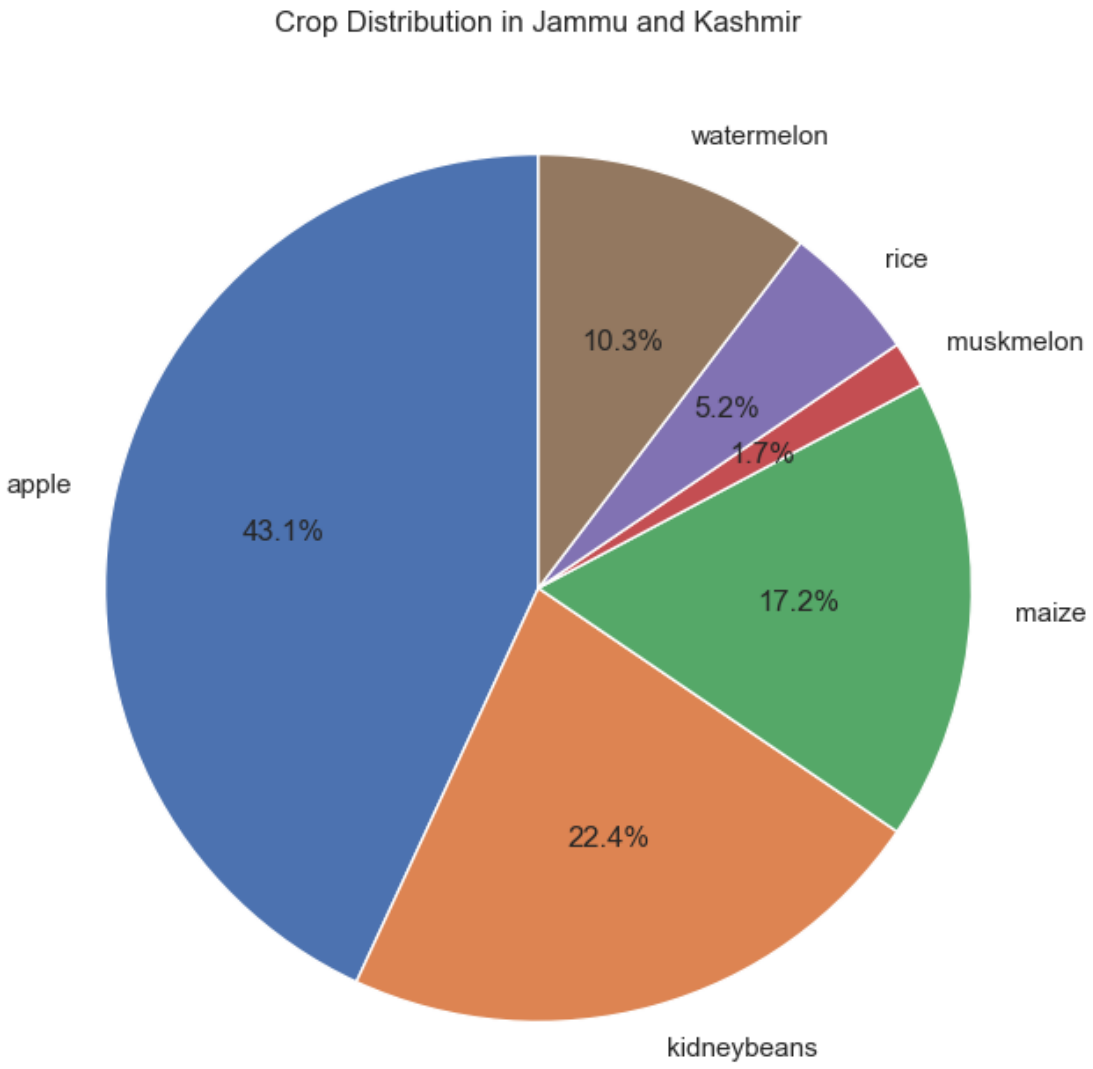
Bar Chart for Crop Distribution by Division

[107]:
```
jammu_kashmir_crop_distribution =␣
  ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
  ↪== 'JammuKashmir']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Jammu and Kashmir')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
  ↪data=jammu_kashmir_crop_distribution)
plt.show()
```



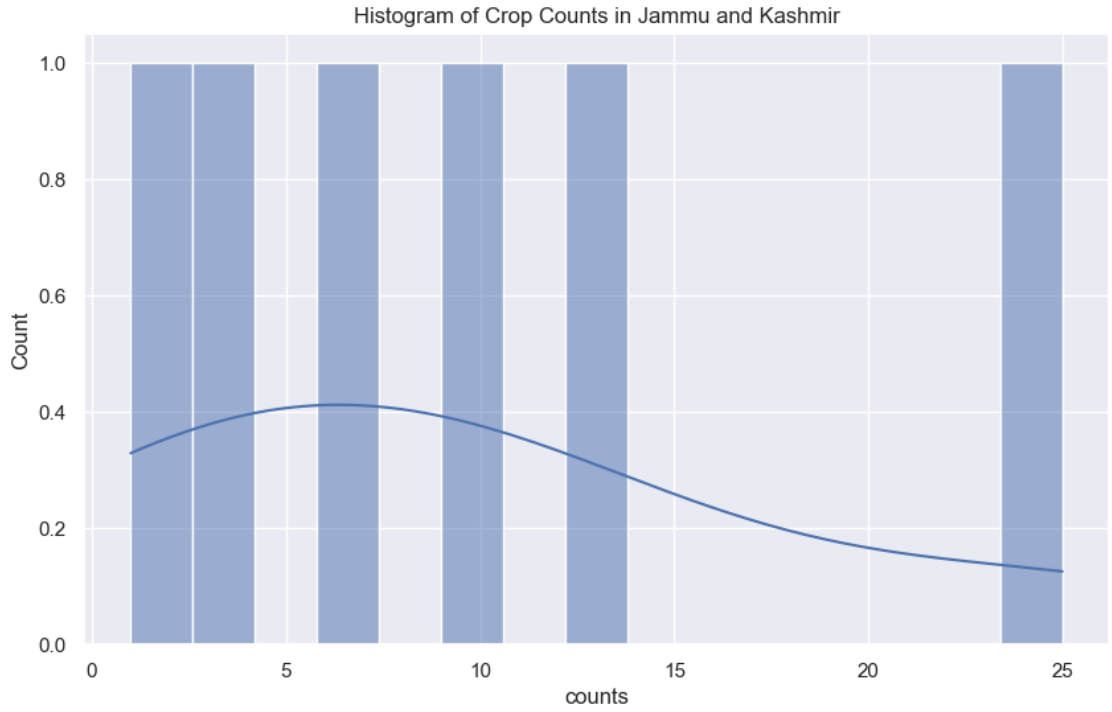
Pie Chart for Crop Distribution

[108]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Jammu and Kashmir')
plt.pie(jammu_kashmir_crop_distribution['counts'],␣
 ↪labels=jammu_kashmir_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in Jammu and Kashmir

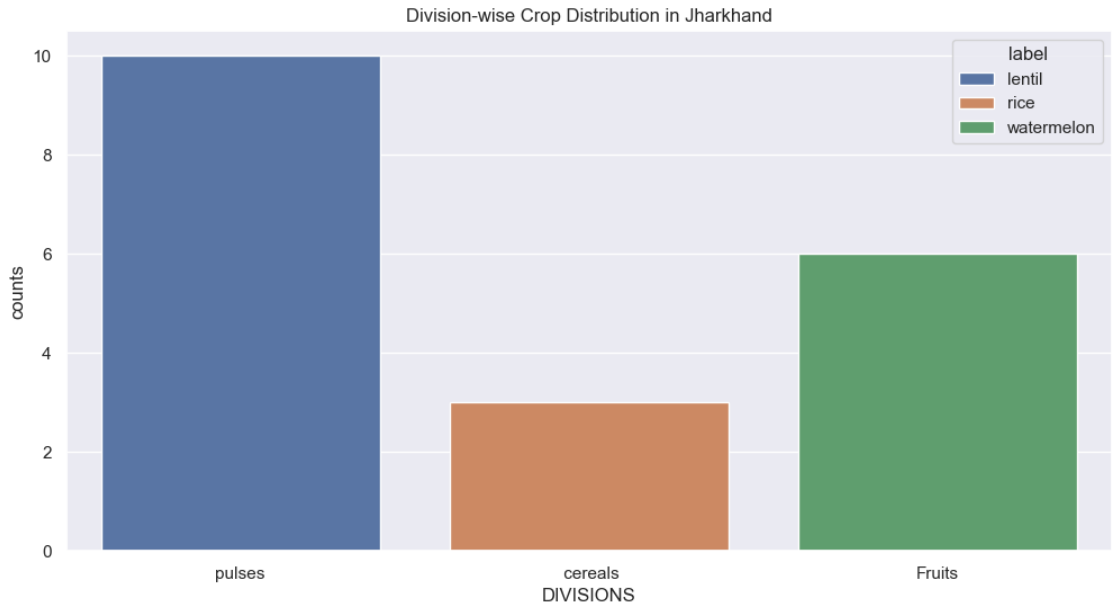
[109]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Jammu and Kashmir')
sns.histplot(jammu_kashmir_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



Jharkhand

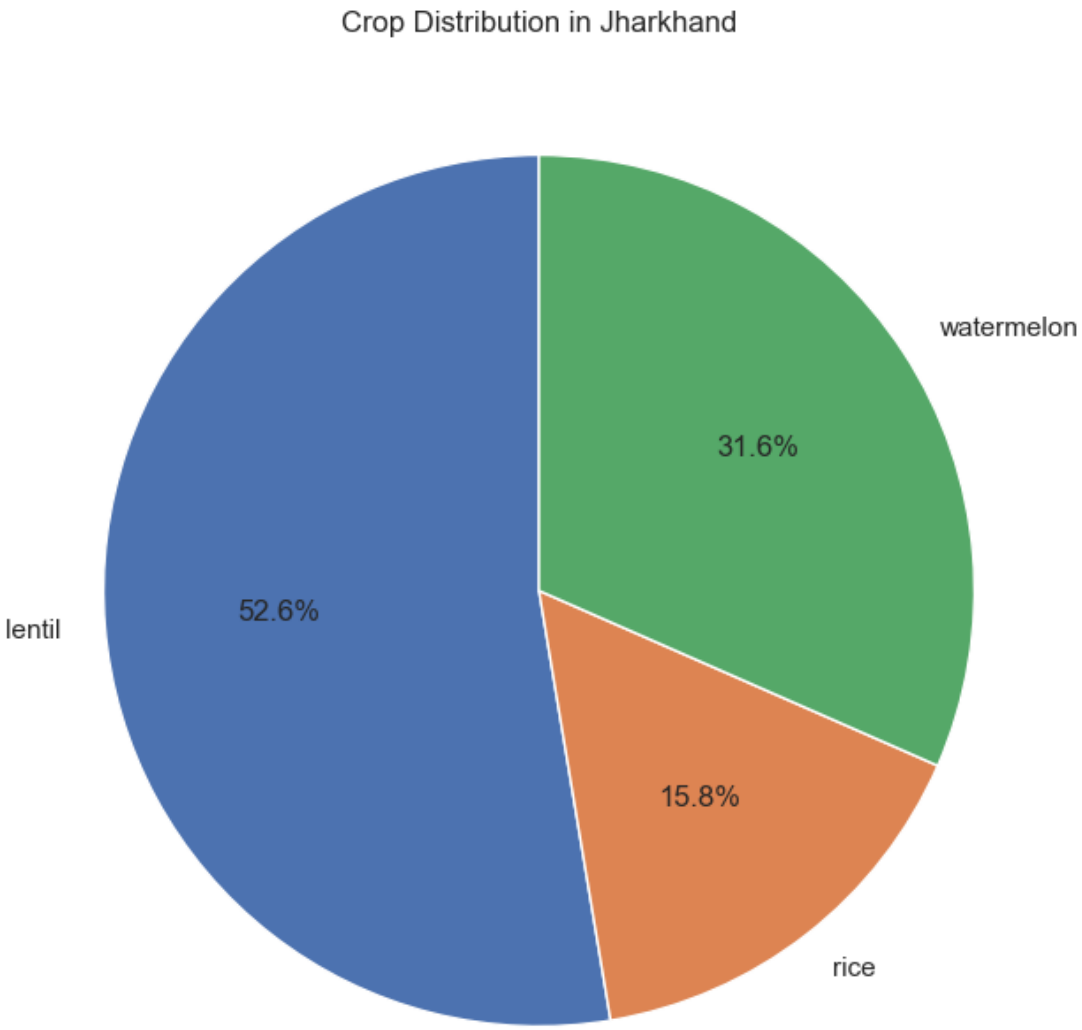
Bar Chart for Crop Distribution by Division

[110]:
```
jharkhand_crop_distribution =␣
  ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
  ↪== 'Jharkhand']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Jharkhand')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
  ↪data=jharkhand_crop_distribution)
plt.show()
```



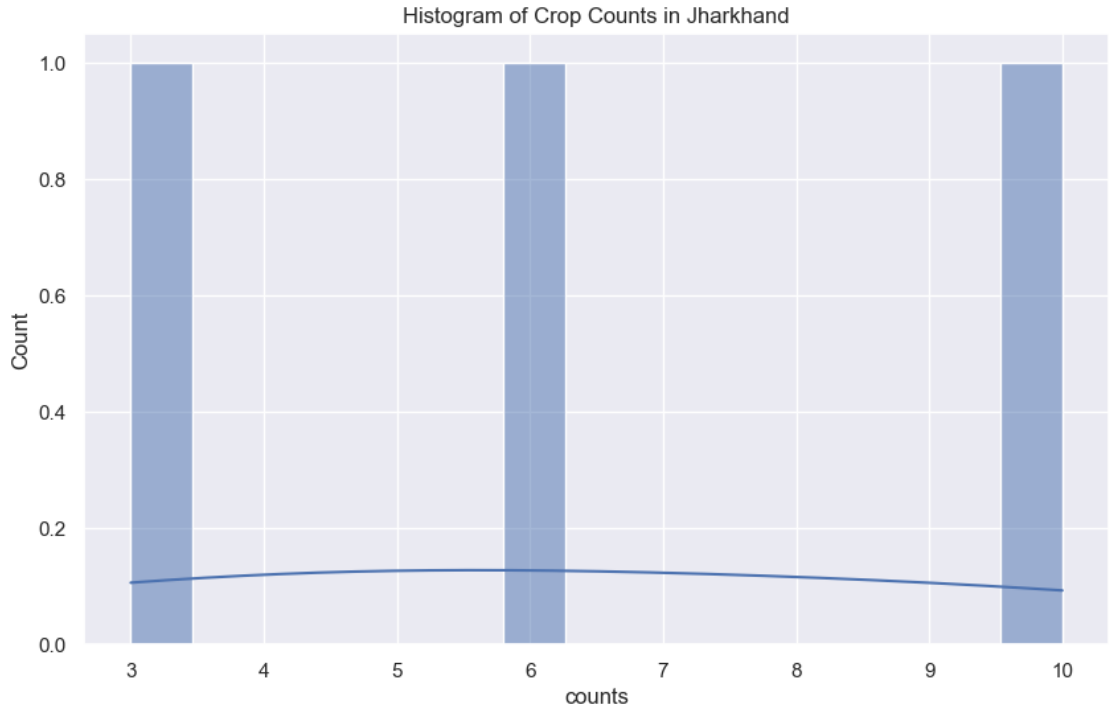
Pie Chart for Crop Distribution

[111]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Jharkhand')
plt.pie(jharkhand_crop_distribution['counts'],␣
 ↪labels=jharkhand_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in Jharkhand

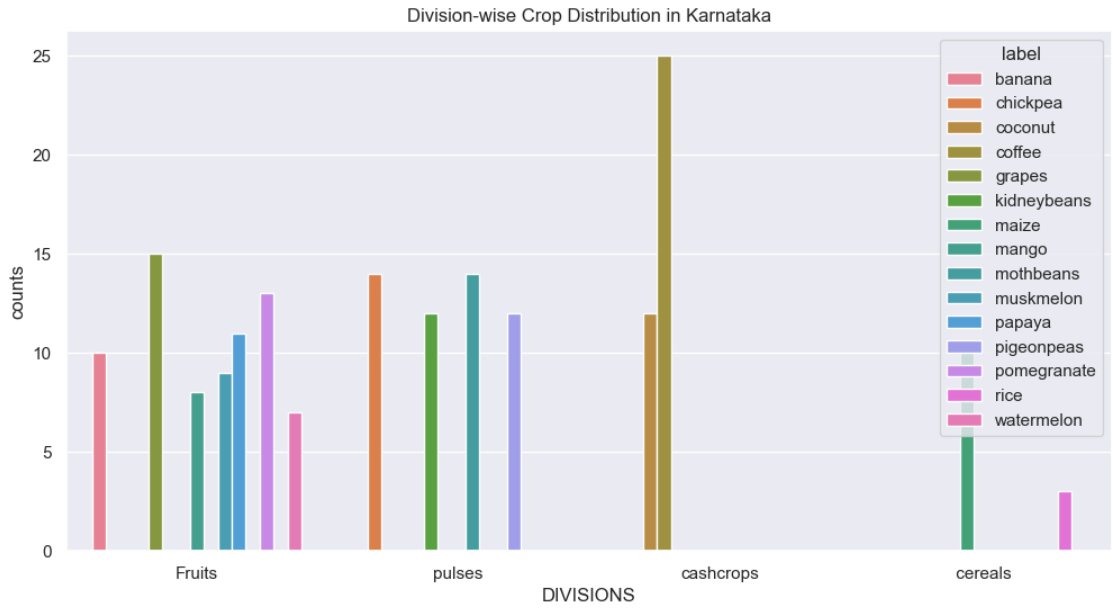
[112]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Jharkhand')
sns.histplot(jharkhand_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



Karnataka

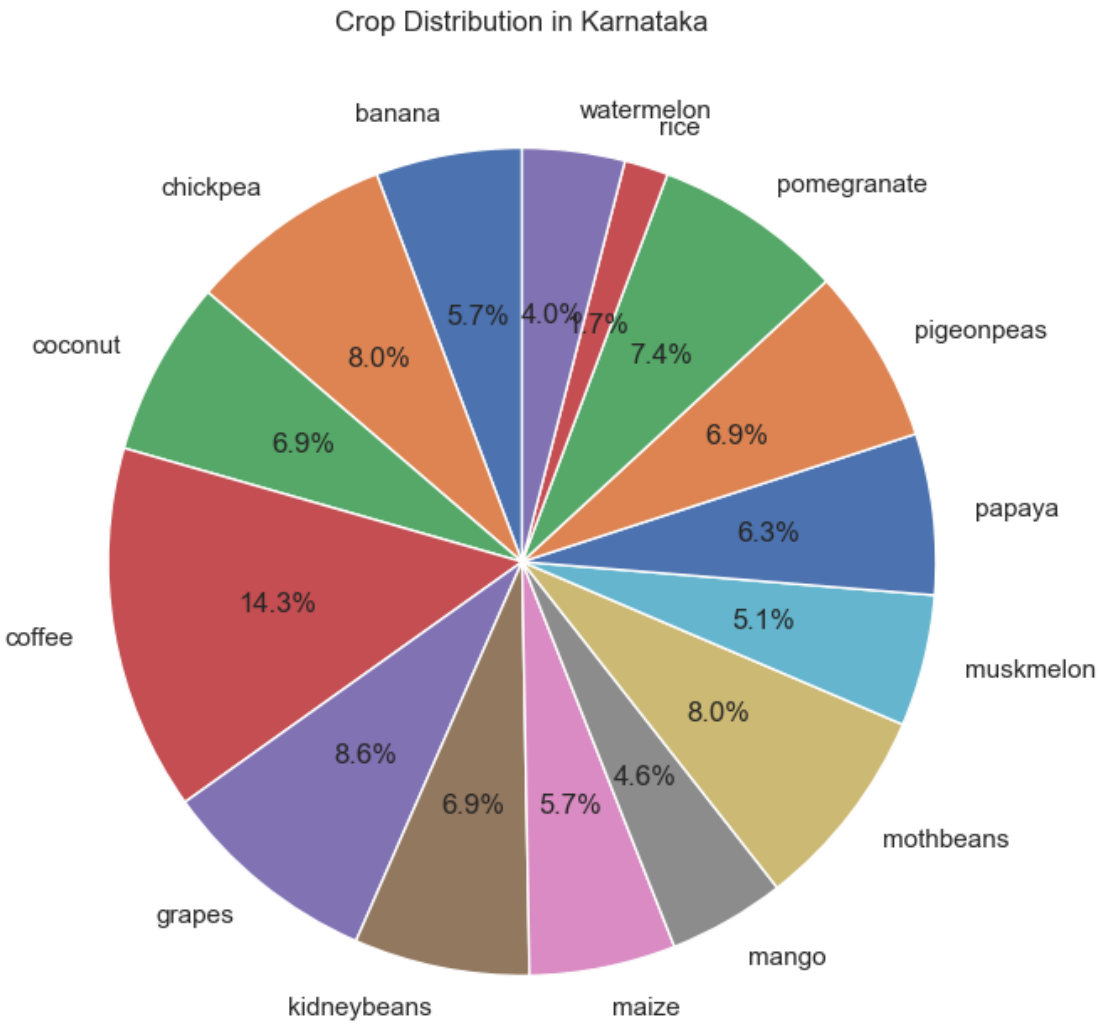
Bar Chart for Crop Distribution by Division

[113]:
```
karnataka_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'Karnataka']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Karnataka')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=karnataka_crop_distribution)
plt.show()
```



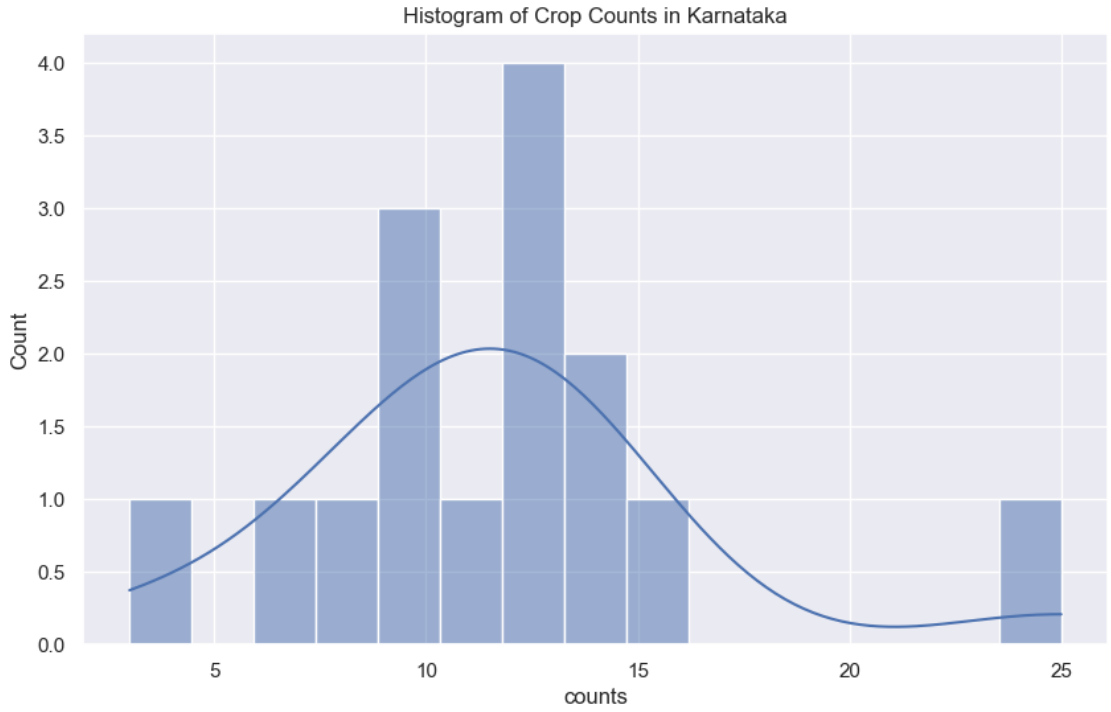
Pie Chart for Crop Distribution

[114]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Karnataka')
plt.pie(karnataka_crop_distribution['counts'],␣
 ↪labels=karnataka_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in Karnataka

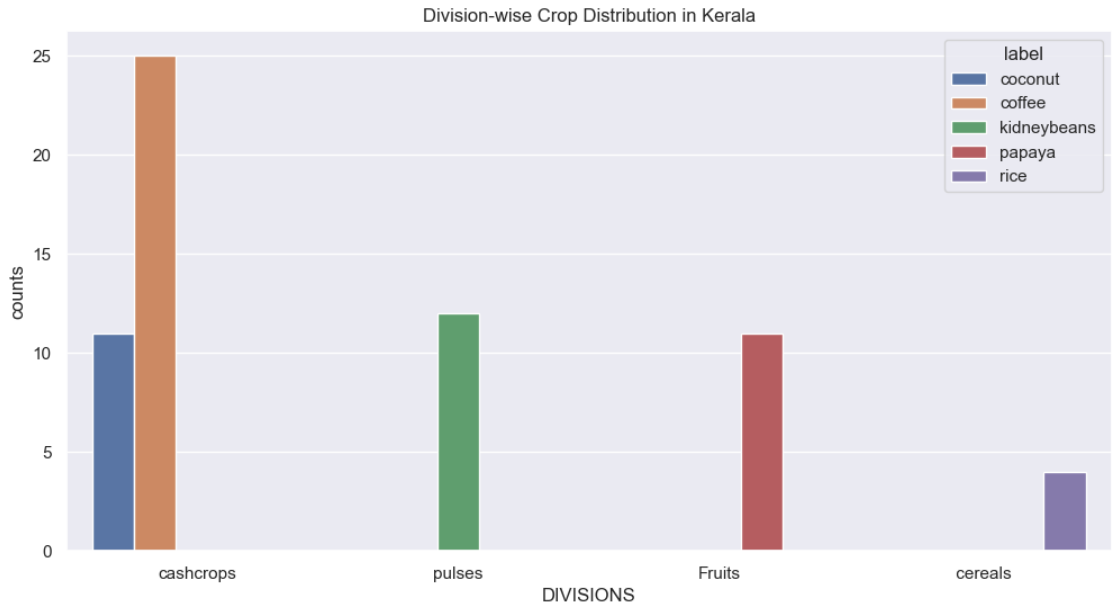
[115]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Karnataka')
sns.histplot(karnataka_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



Kerela

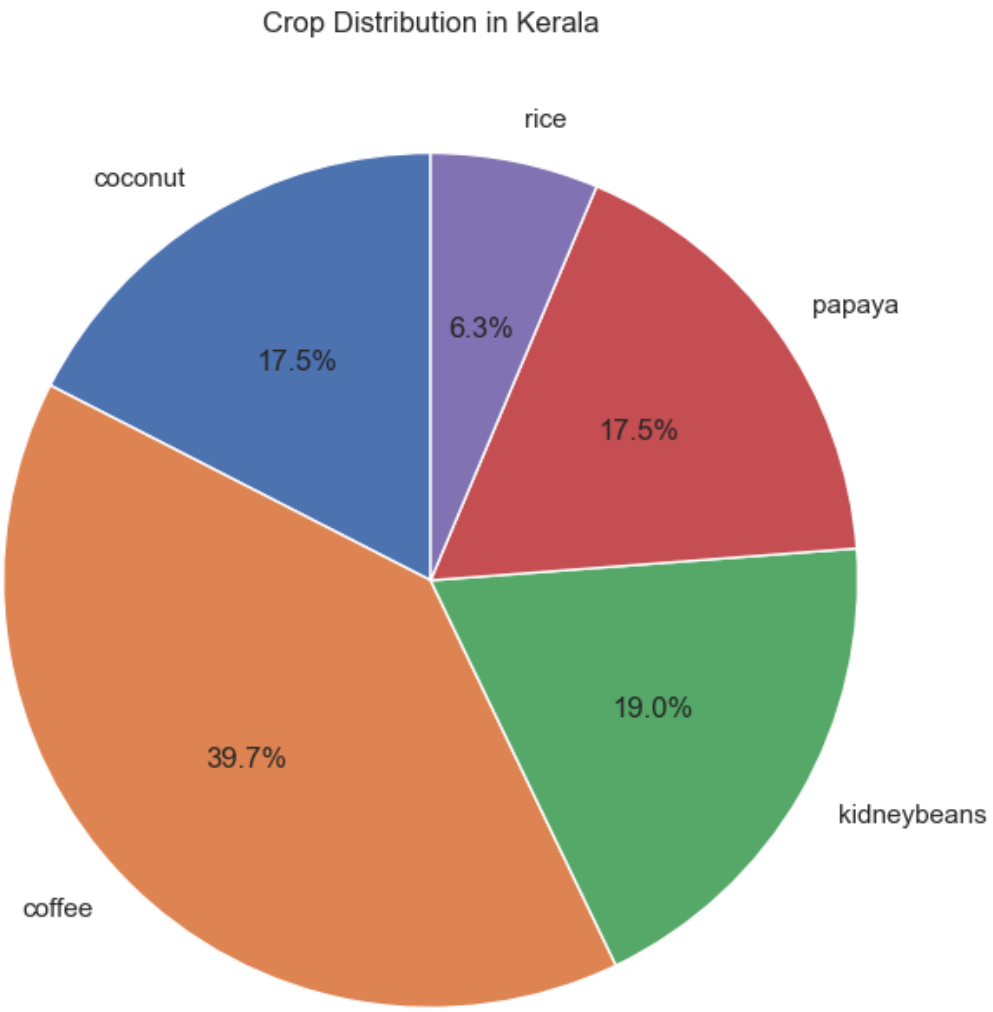
Bar Chart for Crop Distribution by Division

[116]:
```
kerala_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'Kerela']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Kerala')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=kerala_crop_distribution)
plt.show()
```



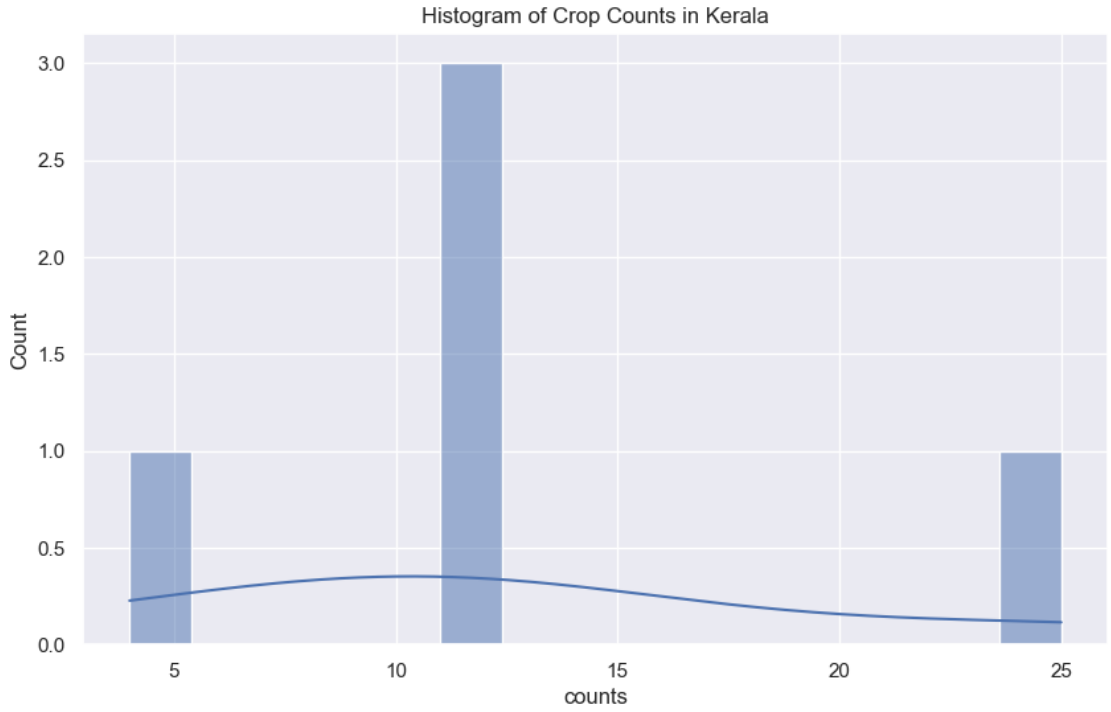
Pie Chart for Crop Distribution

[118]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Kerala')
plt.pie(kerala_crop_distribution['counts'],␣
 ↪labels=kerala_crop_distribution['label'], autopct='%1.1f%%', startangle=90)
plt.show()
```



Histogram for Crop Counts in Kerala

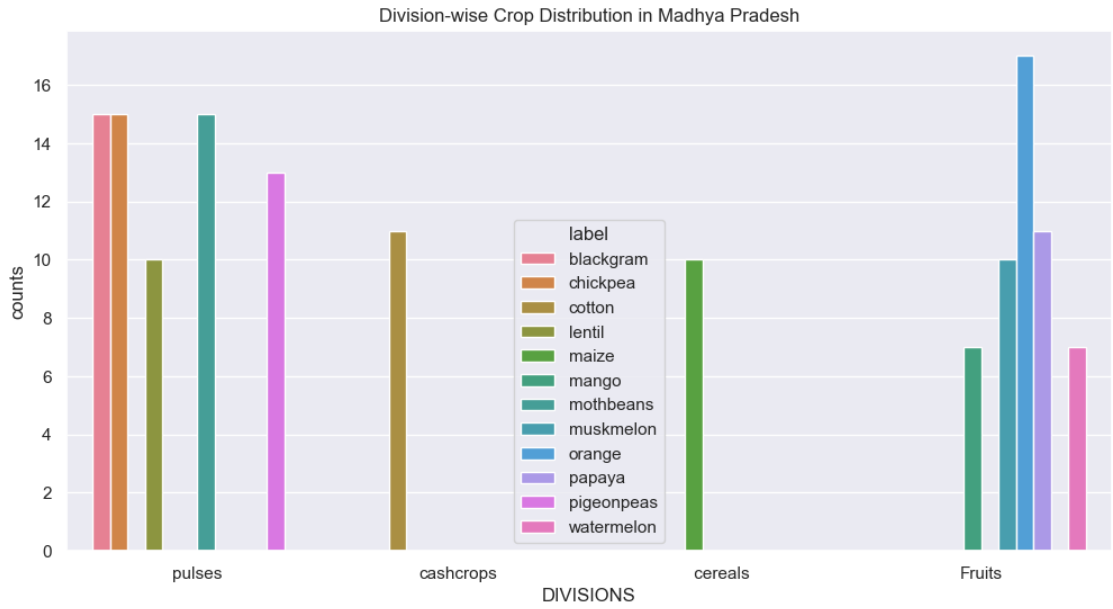
[120]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Kerala')
sns.histplot(kerala_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



MadhyaPradesh

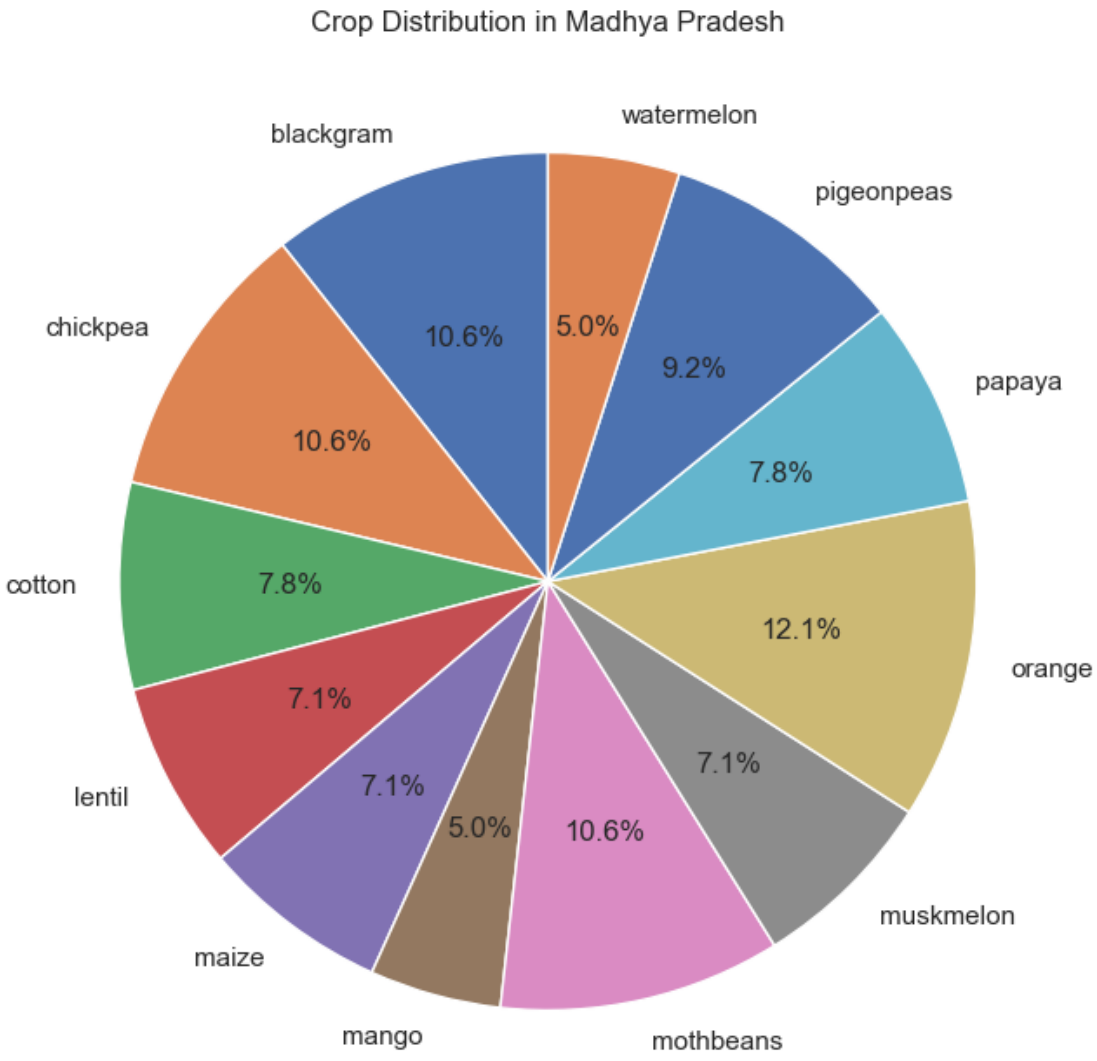
Bar Chart for Crop Distribution by Division

[121]:
```
madhya_pradesh_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'MadhyaPradesh']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Madhya Pradesh')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=madhya_pradesh_crop_distribution)
plt.show()
```



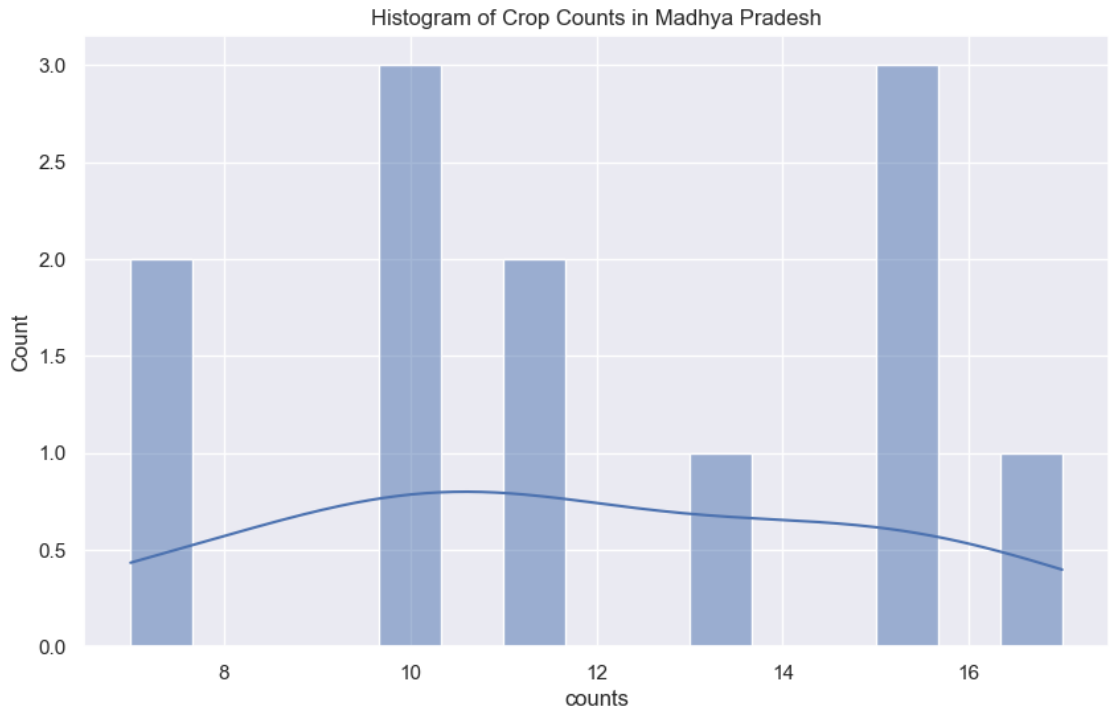
Pie Chart for Crop Distribution

[122]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Madhya Pradesh')
plt.pie(madhya_pradesh_crop_distribution['counts'],␣
 ↪labels=madhya_pradesh_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in Madhya Pradesh

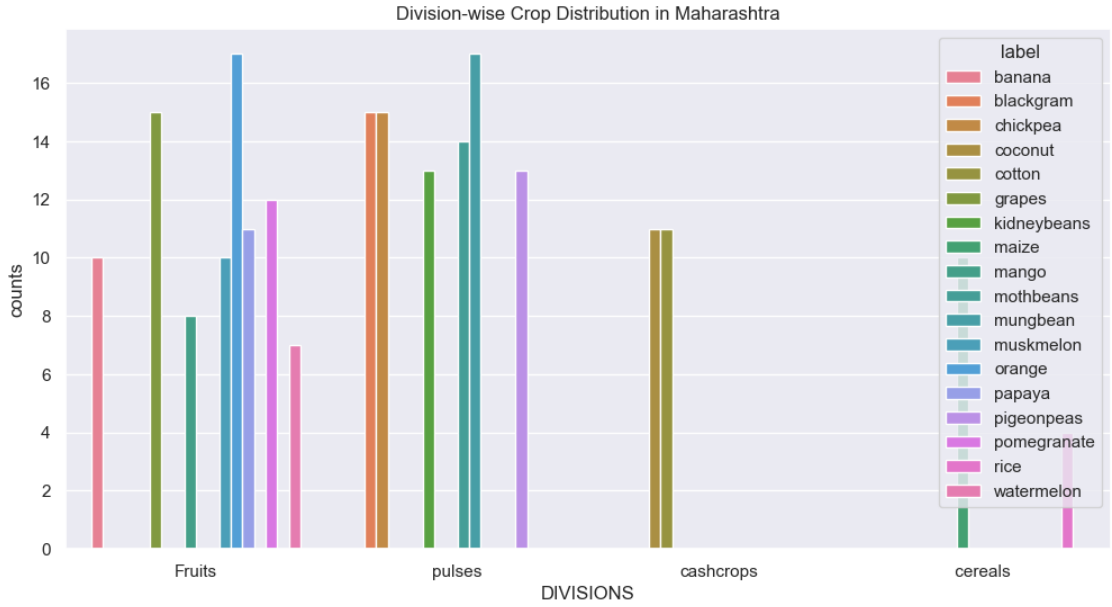
[123]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Madhya Pradesh')
sns.histplot(madhya_pradesh_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



Maharashtra

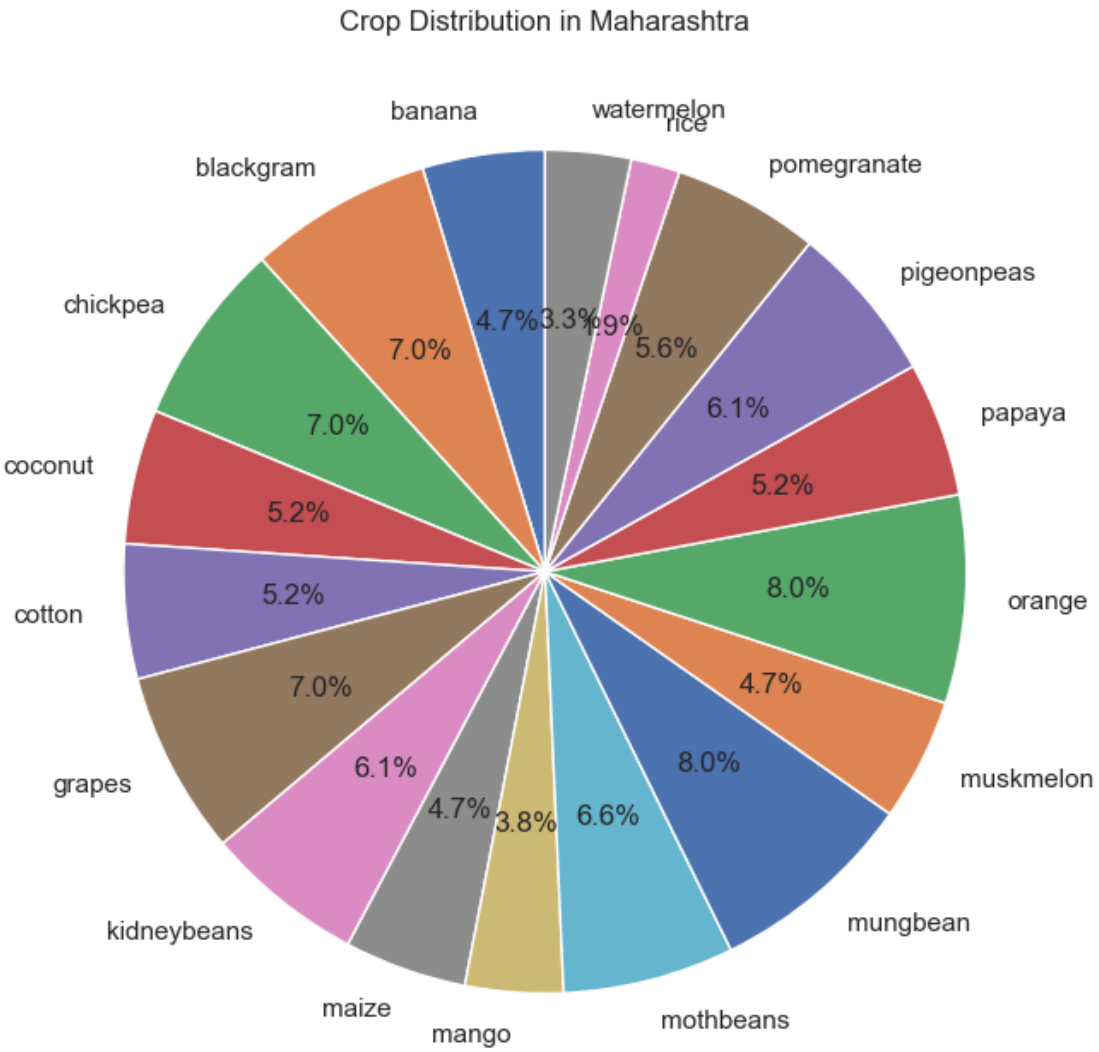
Bar Chart for Crop Distribution by Division

[124]:
```
maharashtra_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'Maharashtra']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Maharashtra')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=maharashtra_crop_distribution)
plt.show()
```



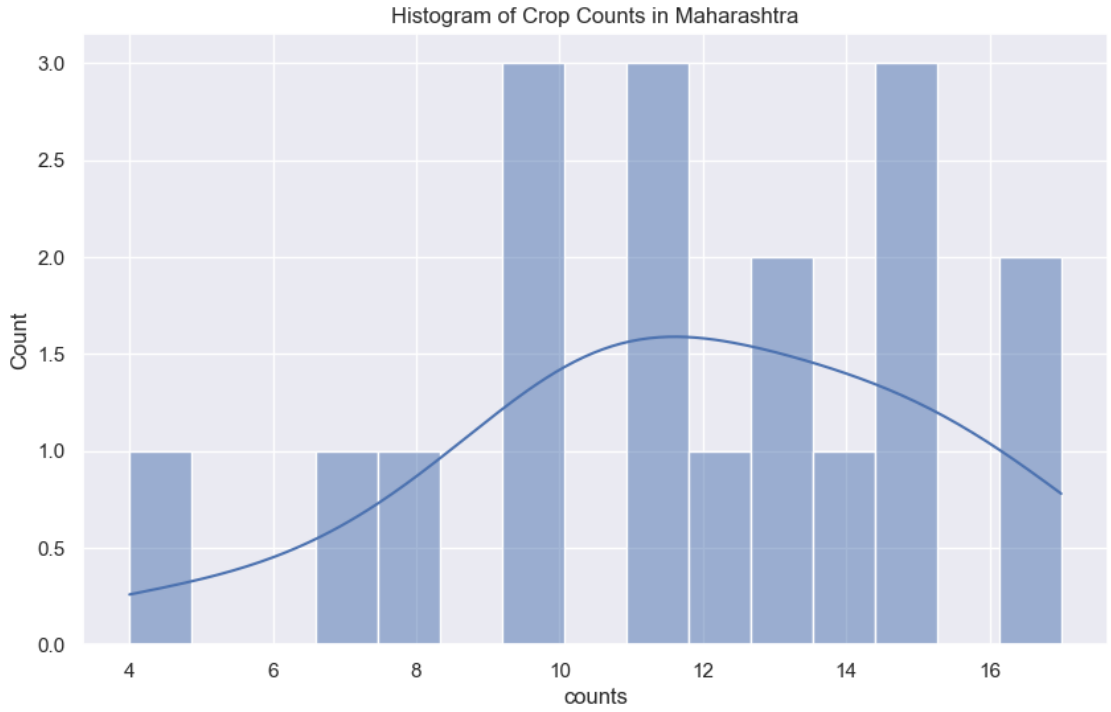
Pie Chart for Crop Distribution

[125]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Maharashtra')
plt.pie(maharashtra_crop_distribution['counts'],␣
 ↪labels=maharashtra_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in Maharashtra

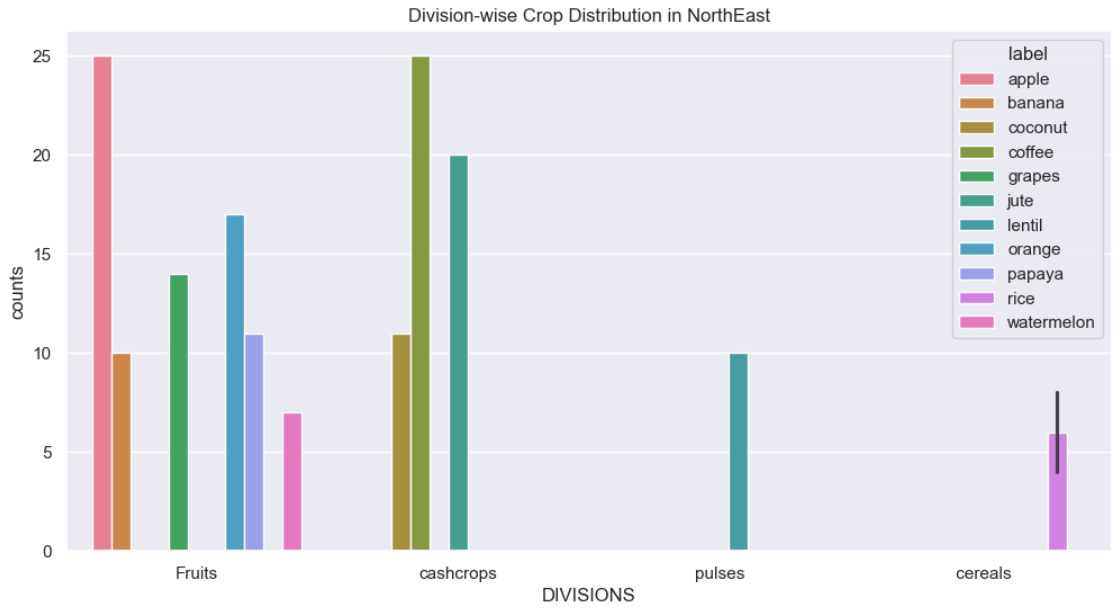
[126]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Maharashtra')
sns.histplot(maharashtra_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



NorthEast

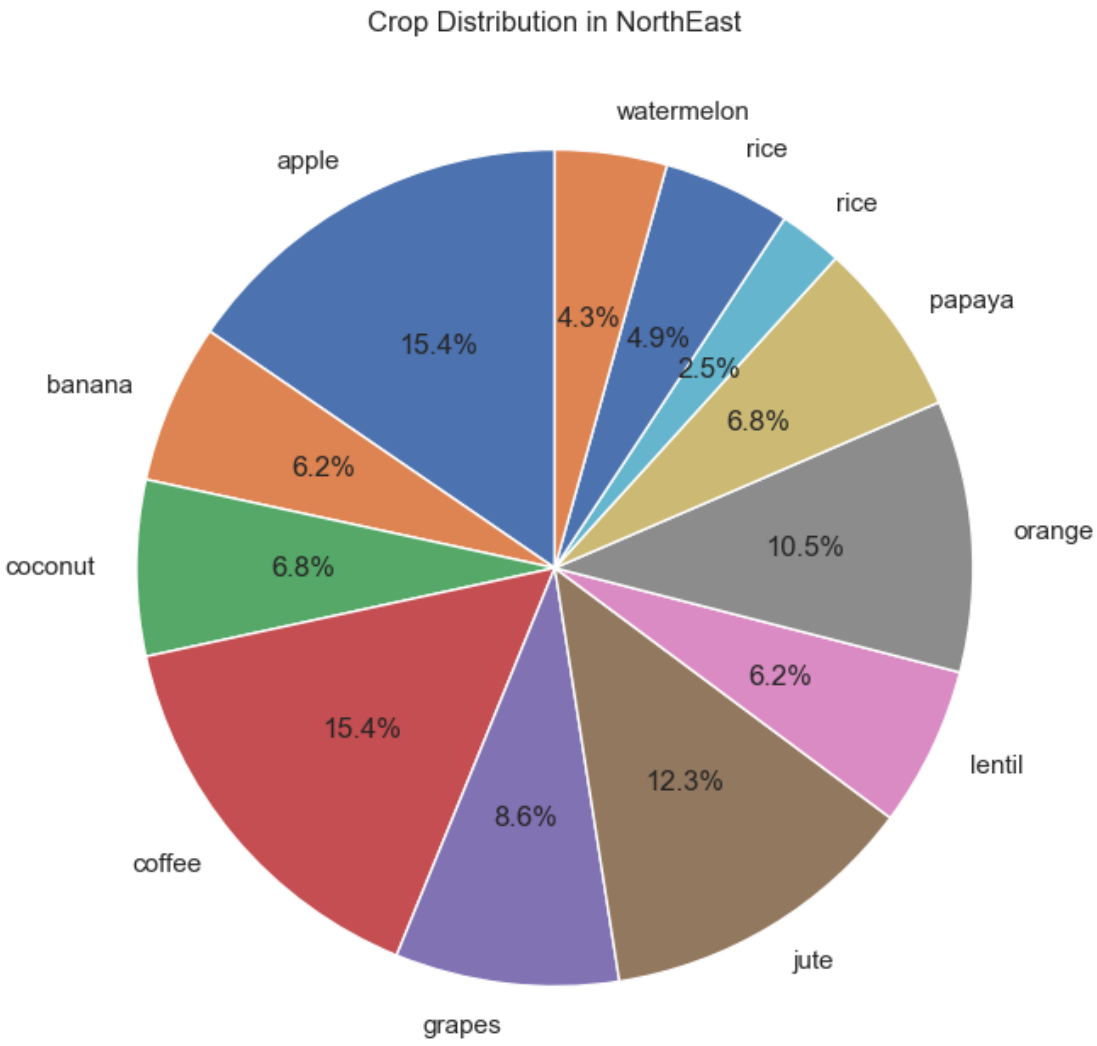
Bar Chart for Crop Distribution by Division

[127]:
```
northeast_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'NorthEast']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in NorthEast')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=northeast_crop_distribution)
plt.show()
```



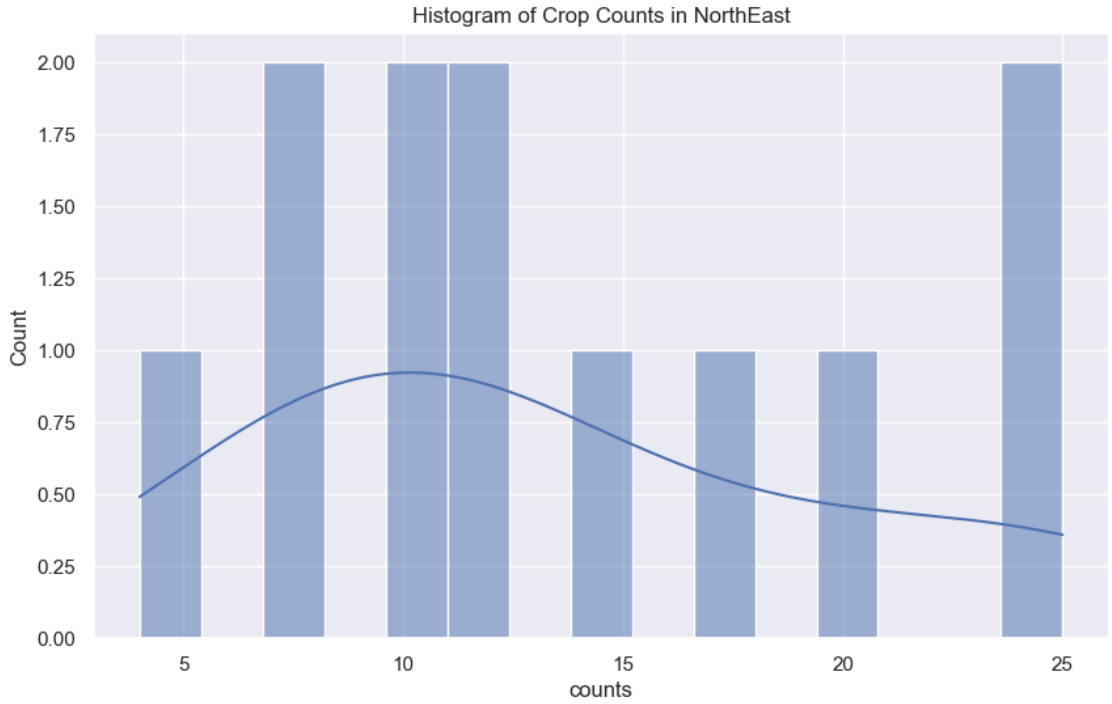
Pie Chart for Crop Distribution

[129]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in NorthEast')
plt.pie(northeast_crop_distribution['counts'],␣
 ↪labels=northeast_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in NorthEast

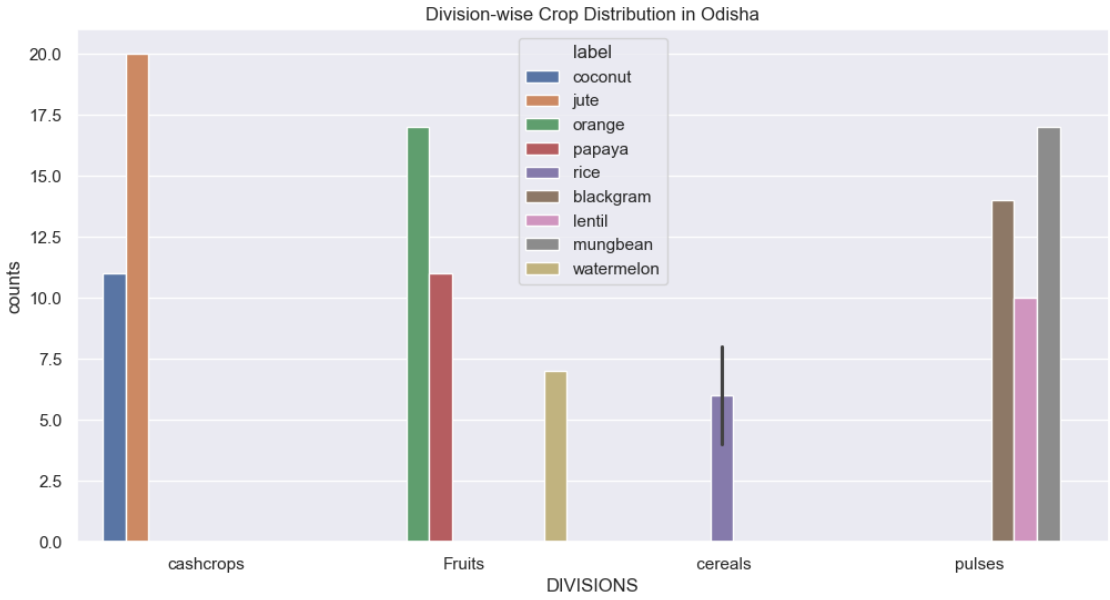
[130]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in NorthEast')
sns.histplot(northeast_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



Orisa

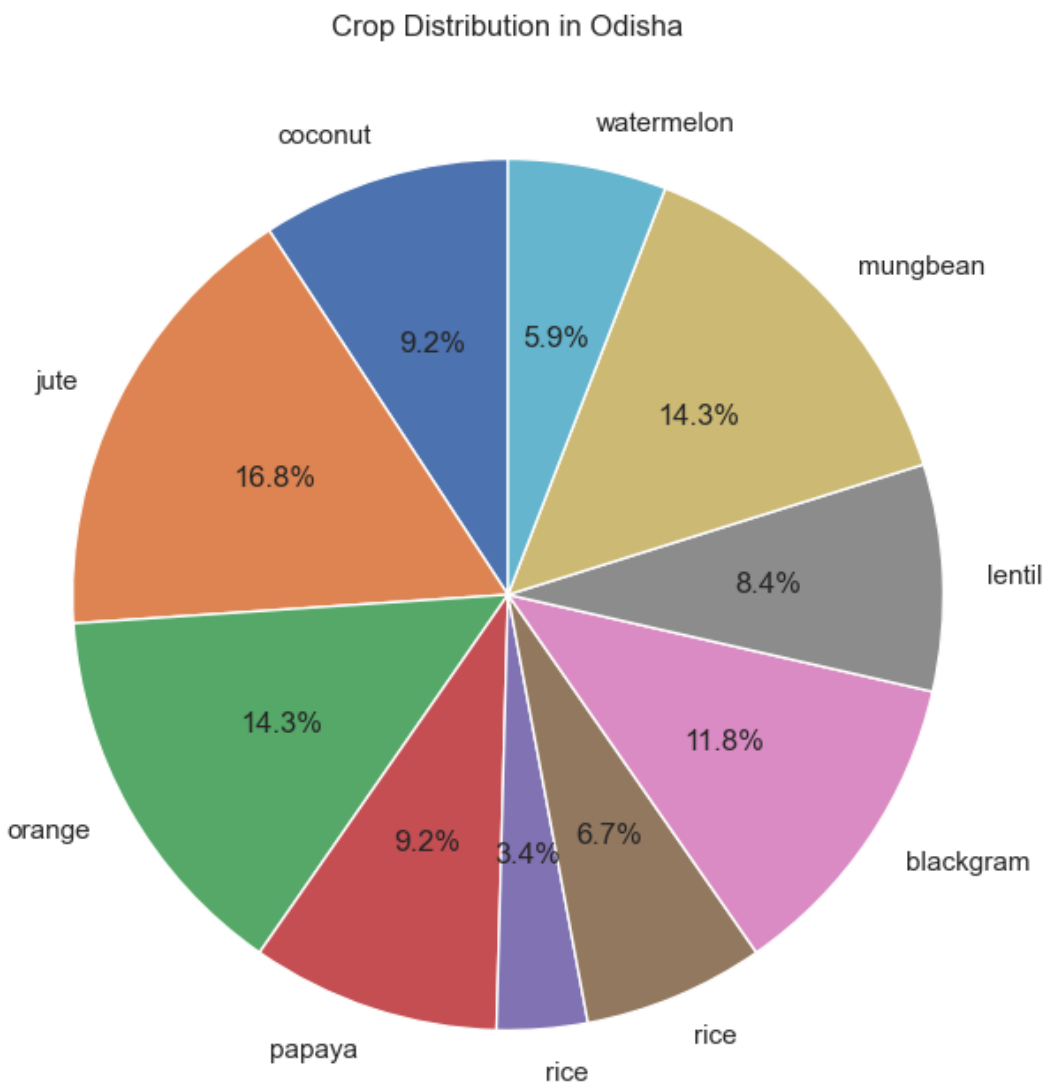
Bar Chart for Crop Distribution by Division

[131]:
```
odisha_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States'].
 ↪isin(['Orisa', 'Orrisa'])]

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Odisha')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=odisha_crop_distribution)
plt.show()
```



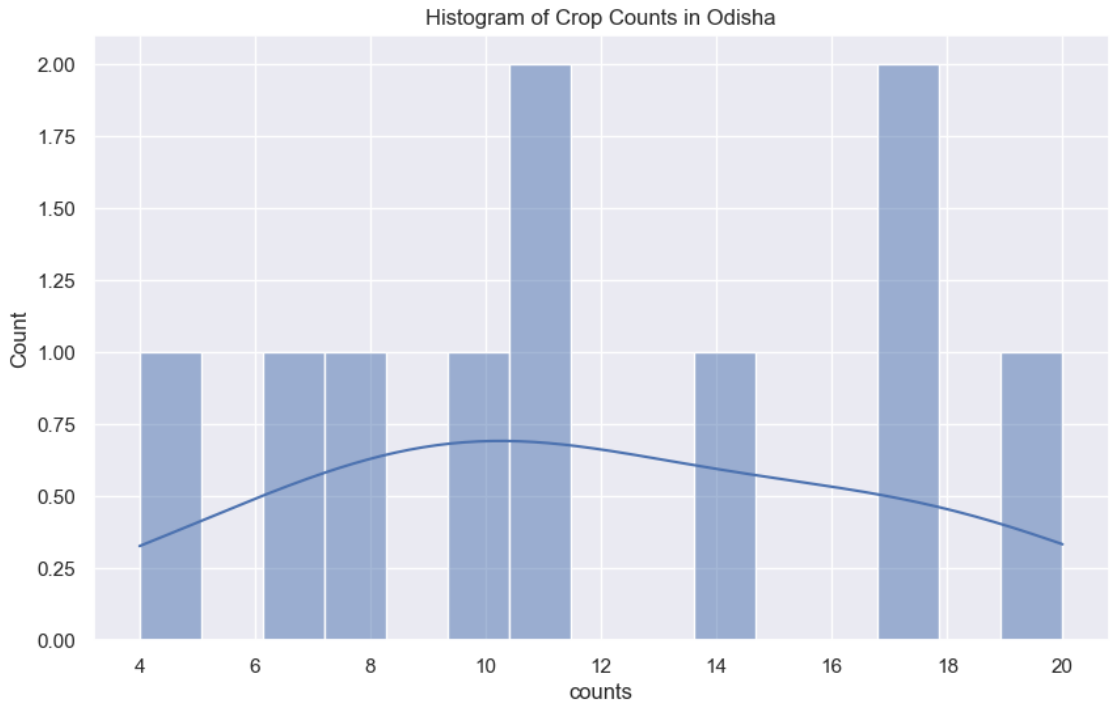
Pie Chart for Crop Distribution

[133]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Odisha')
plt.pie(odisha_crop_distribution['counts'],␣
  ↪labels=odisha_crop_distribution['label'], autopct='%1.1f%%', startangle=90)
plt.show()
```



Histogram for Crop Counts in Odisha

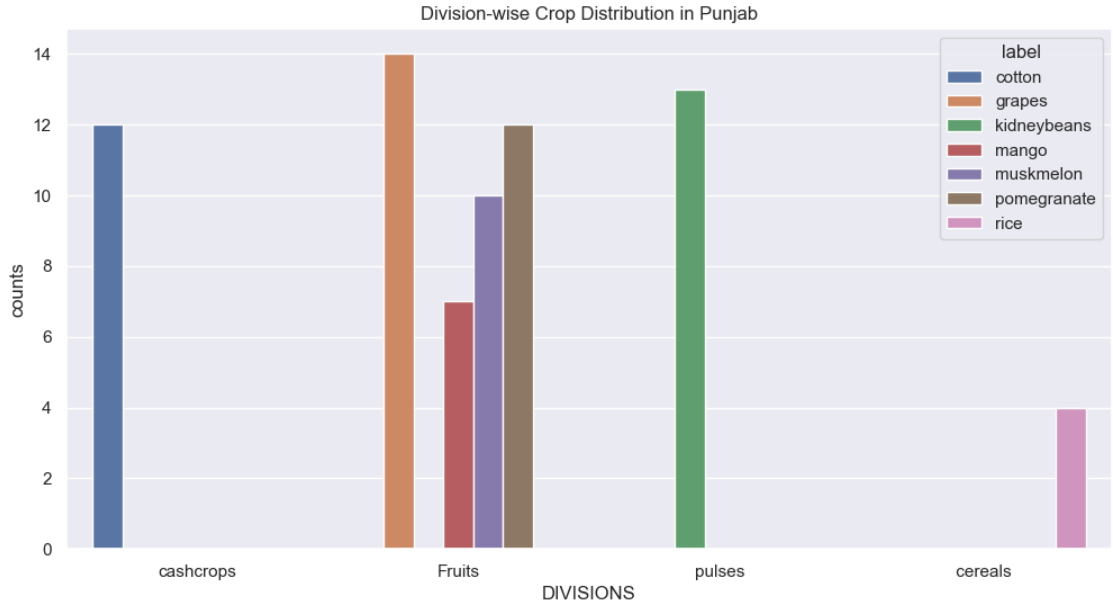
[134]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Odisha')
sns.histplot(odisha_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



PUNJAB

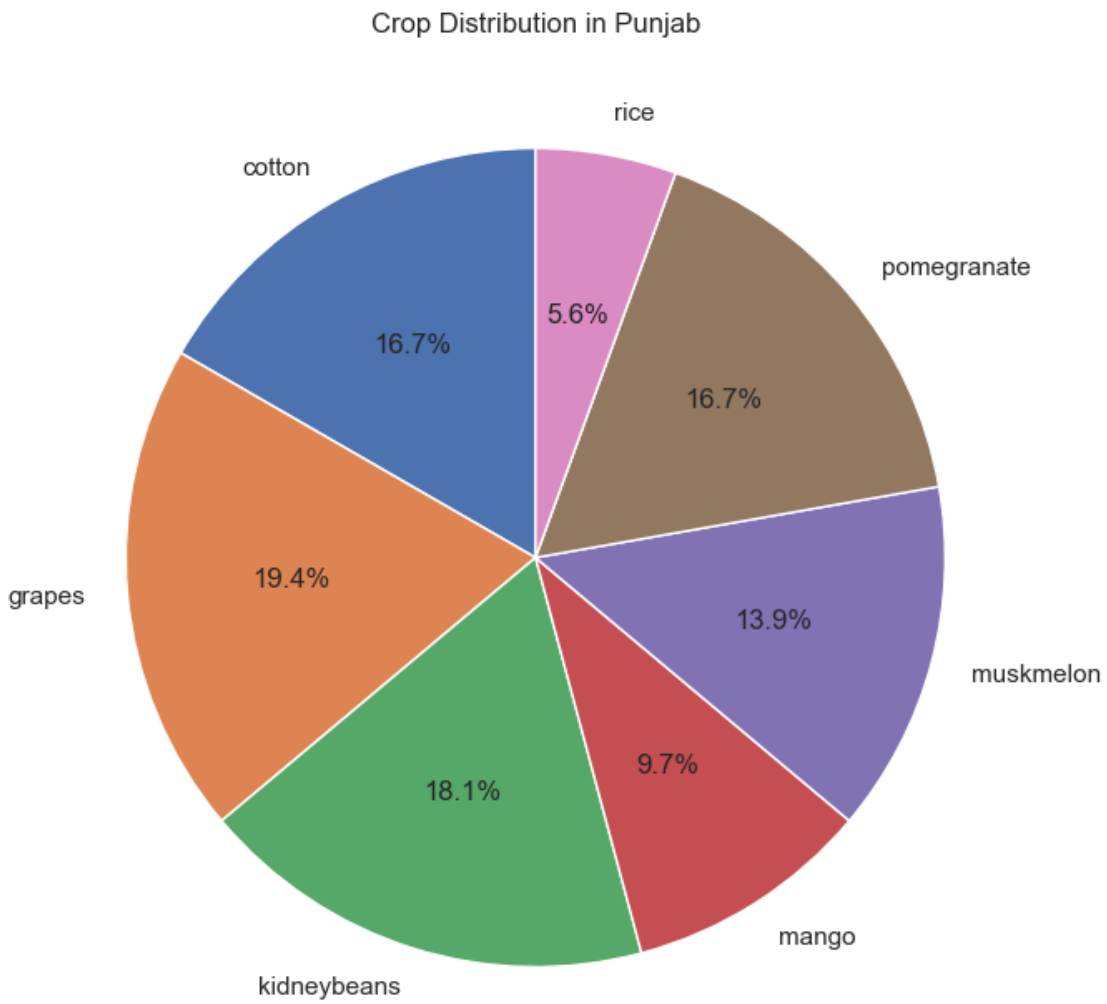
Bar Chart for Crop Distribution by Division

[135]:
```
punjab_crop_distribution =␣
  ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
  ↪== 'Punjab']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Punjab')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
  ↪data=punjab_crop_distribution)
plt.show()
```



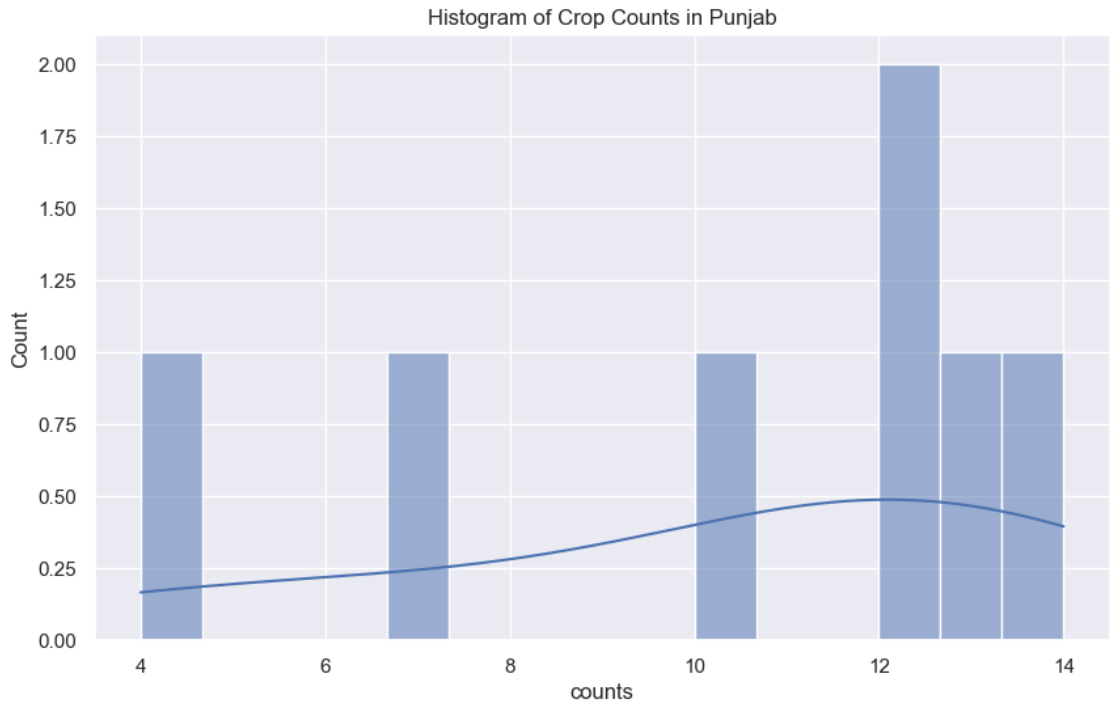
Pie Chart for Crop Distribution

[136]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Punjab')
plt.pie(punjab_crop_distribution['counts'],␣
 ↪labels=punjab_crop_distribution['label'], autopct='%1.1f%%', startangle=90)
plt.show()
```



Histogram for Crop Counts in Punjab

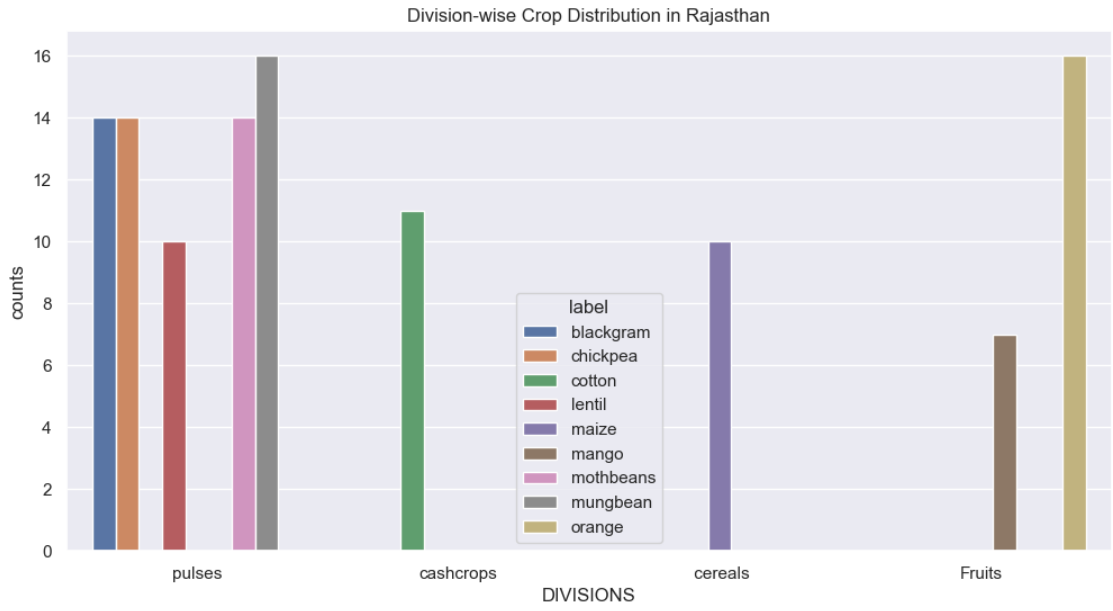
[137]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Punjab')
sns.histplot(punjab_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



Rajasthan

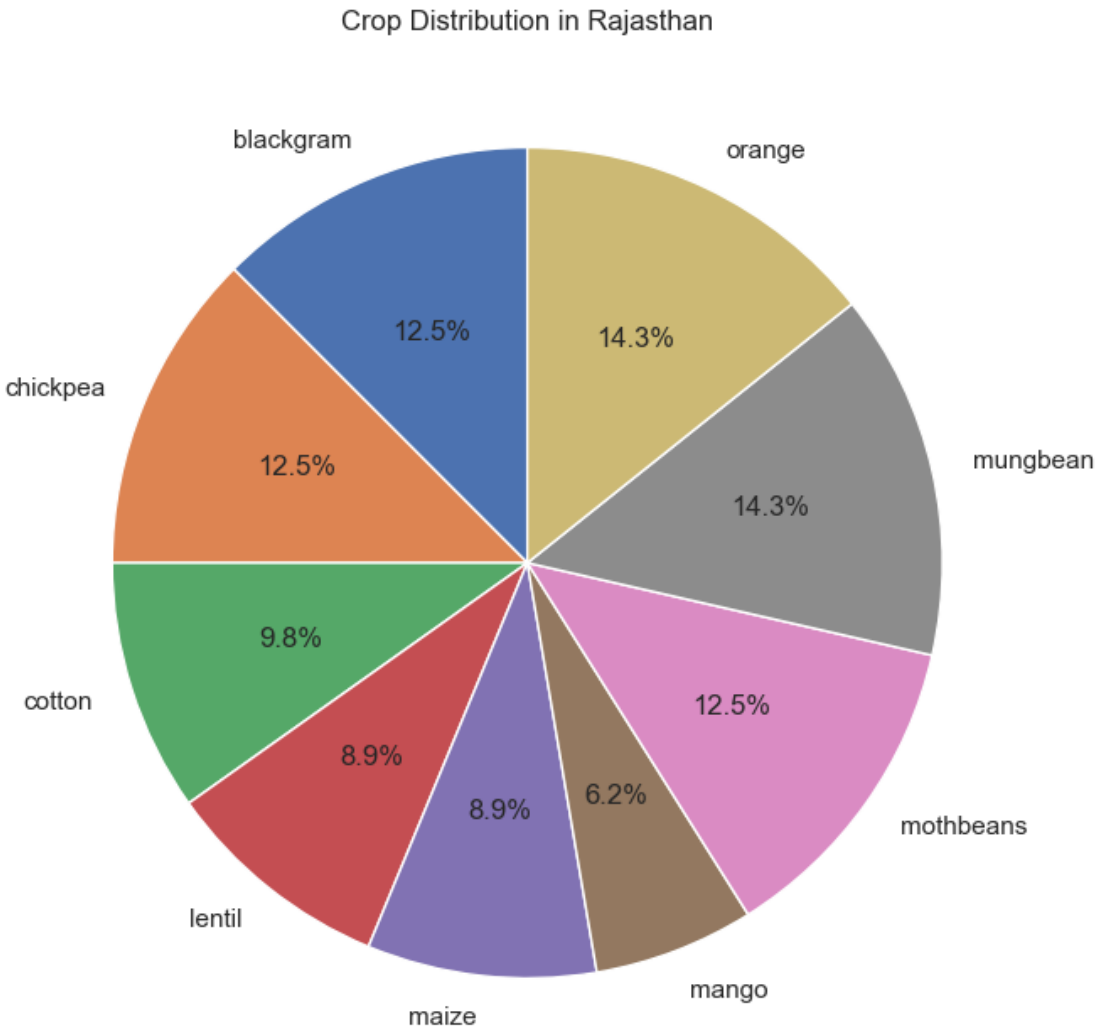
Bar Chart for Crop Distribution by Division

[139]:
```
rajasthan_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'Rajasthan']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Rajasthan')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=rajasthan_crop_distribution)
plt.show()
```



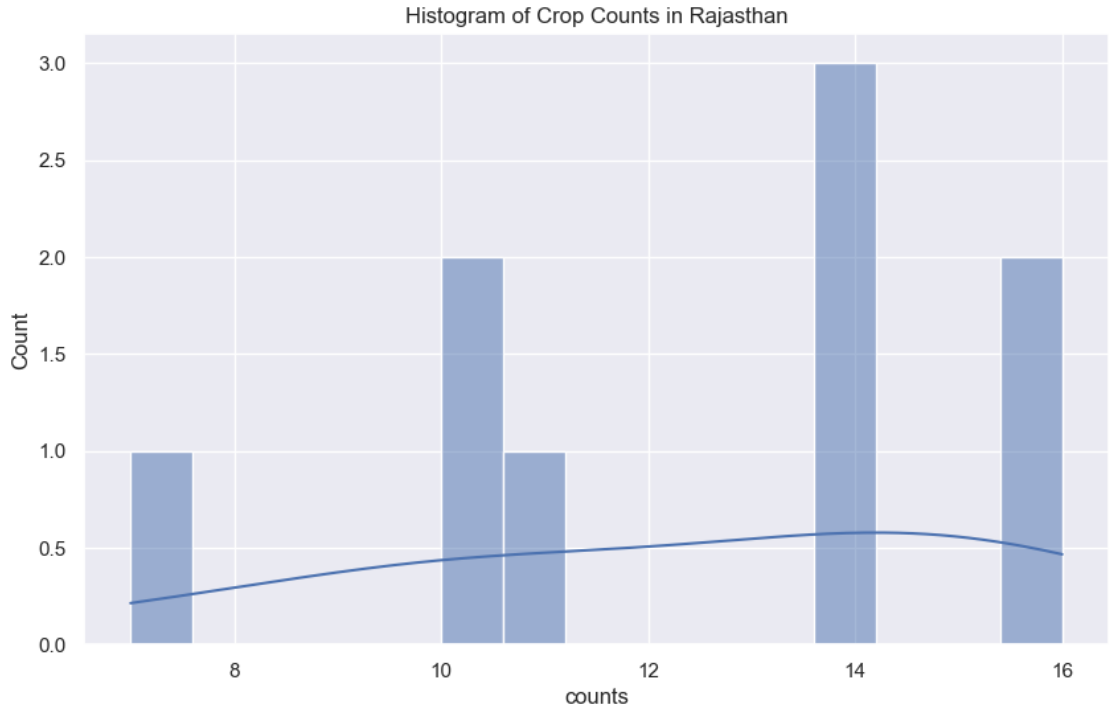
Pie Chart for Crop Distribution

[140]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Rajasthan')
plt.pie(rajasthan_crop_distribution['counts'],␣
 ↪labels=rajasthan_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in Rajasthan

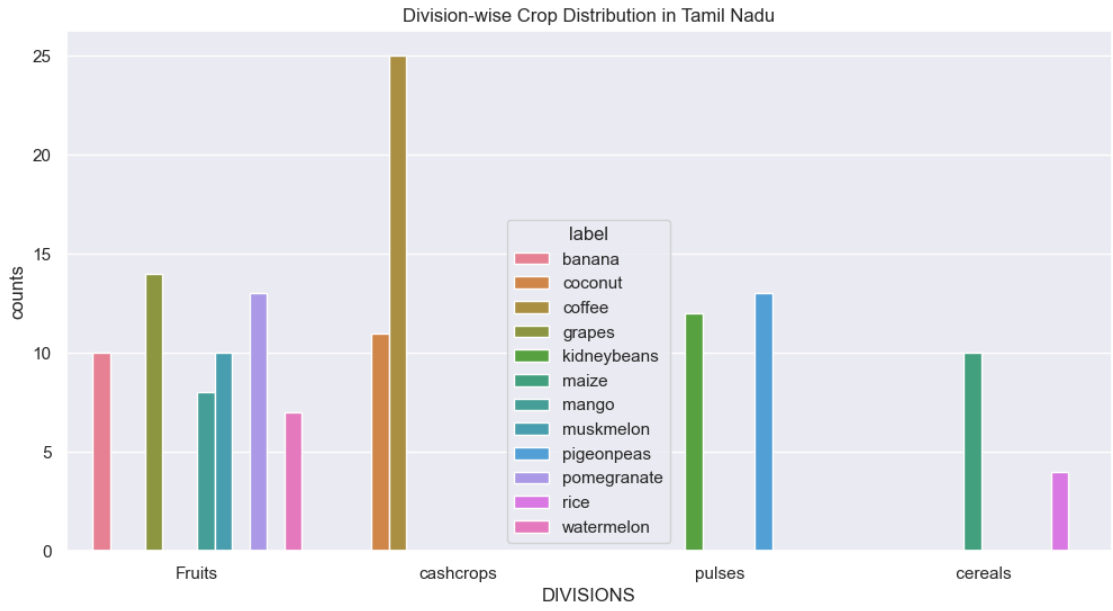
[141]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Rajasthan')
sns.histplot(rajasthan_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



TamilNadu

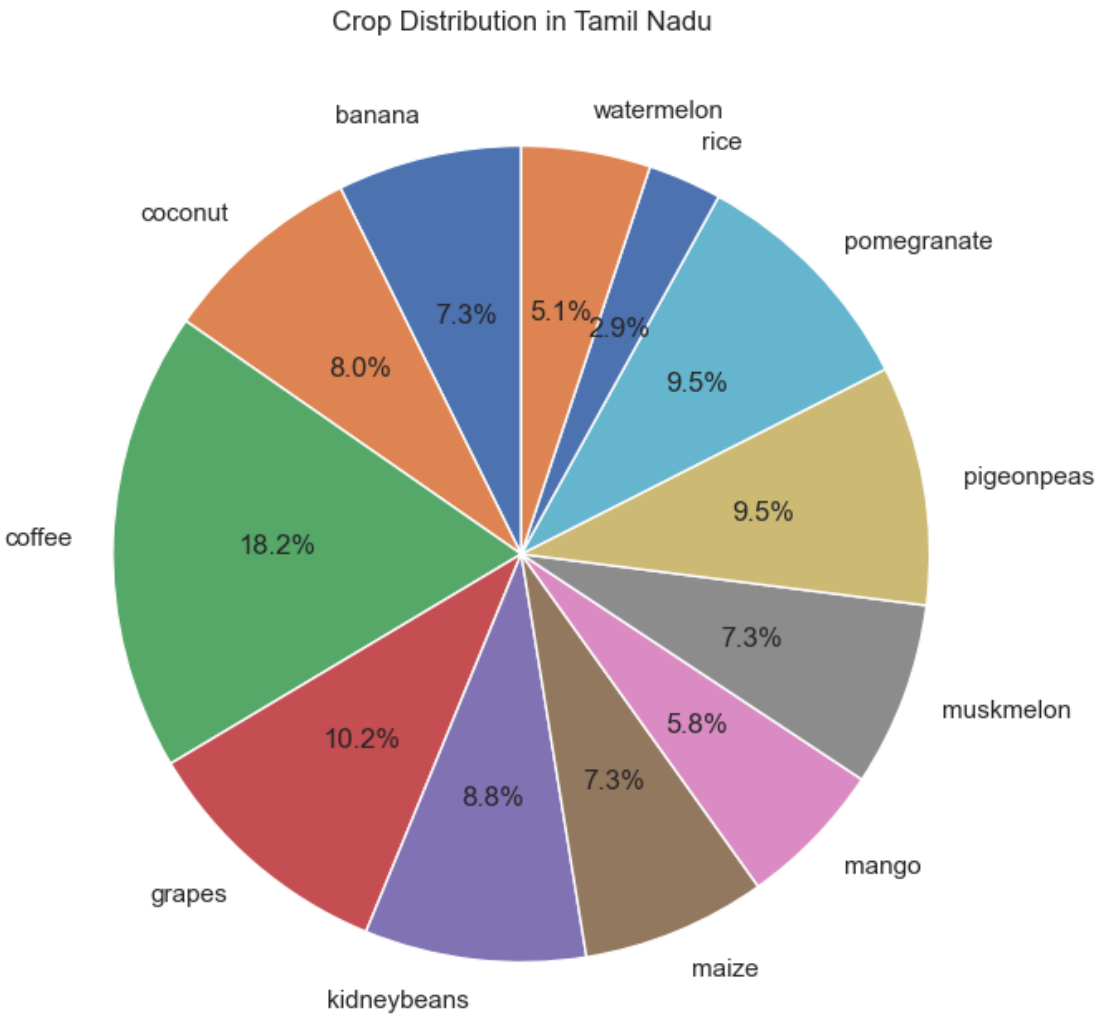
Bar Chart for Crop Distribution by Division

[142]:
```
tamil_nadu_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'TamilNadu']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Tamil Nadu')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=tamil_nadu_crop_distribution)
plt.show()
```



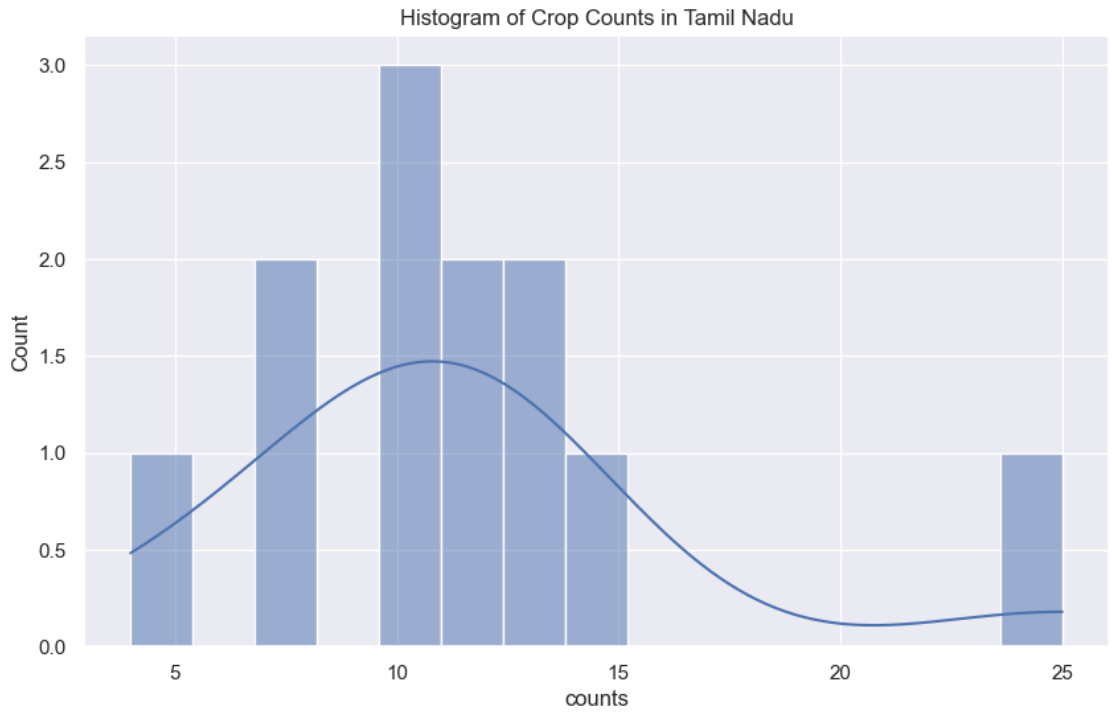
Pie Chart for Crop Distribution

[143]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Tamil Nadu')
plt.pie(tamil_nadu_crop_distribution['counts'],␣
 ↪labels=tamil_nadu_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in Tamil Nadu

[144]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Tamil Nadu')
sns.histplot(tamil_nadu_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



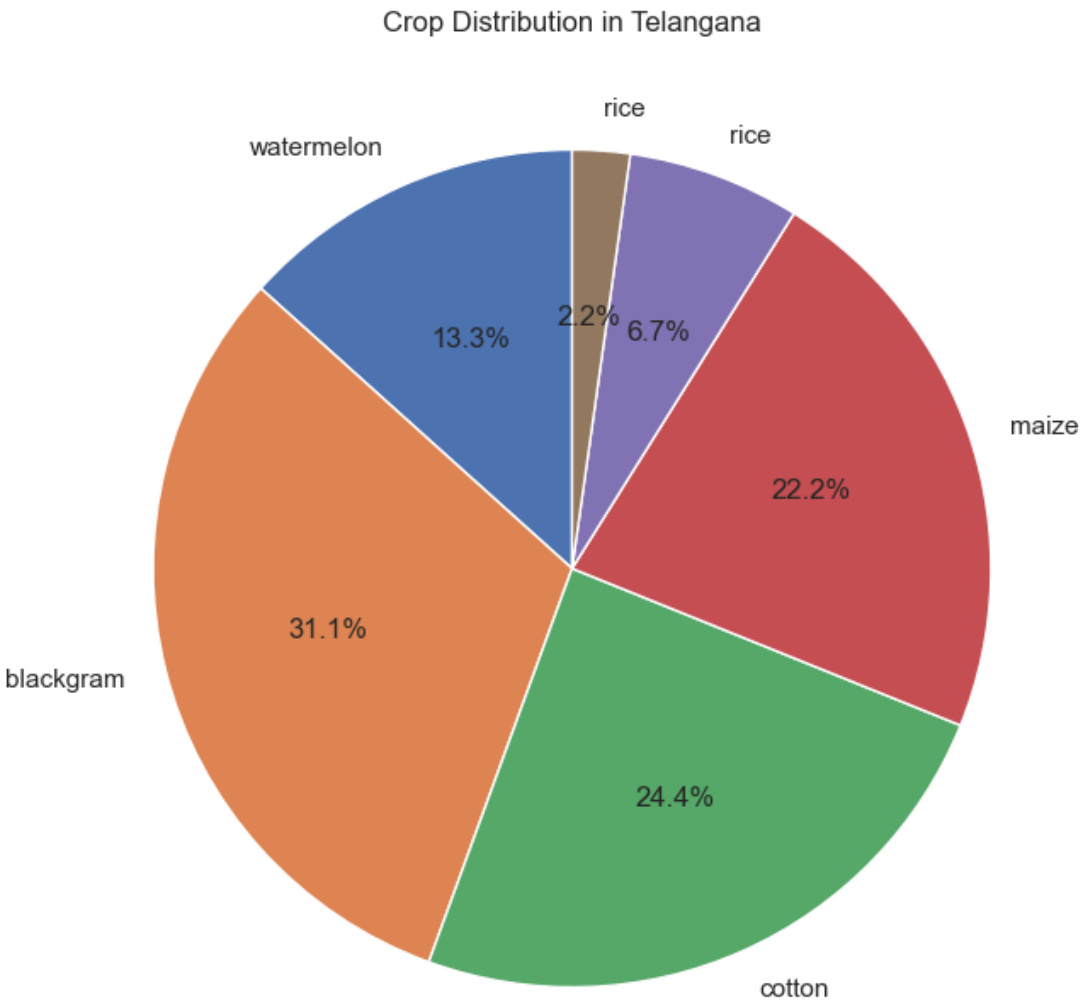
Telangana

Bar Chart for Crop Distribution by Division

[145]:
```
telangana_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States'].
 ↪isin(['Telangana', 'Telengana'])]

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Telangana')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=telangana_crop_distribution)
plt.show()
```

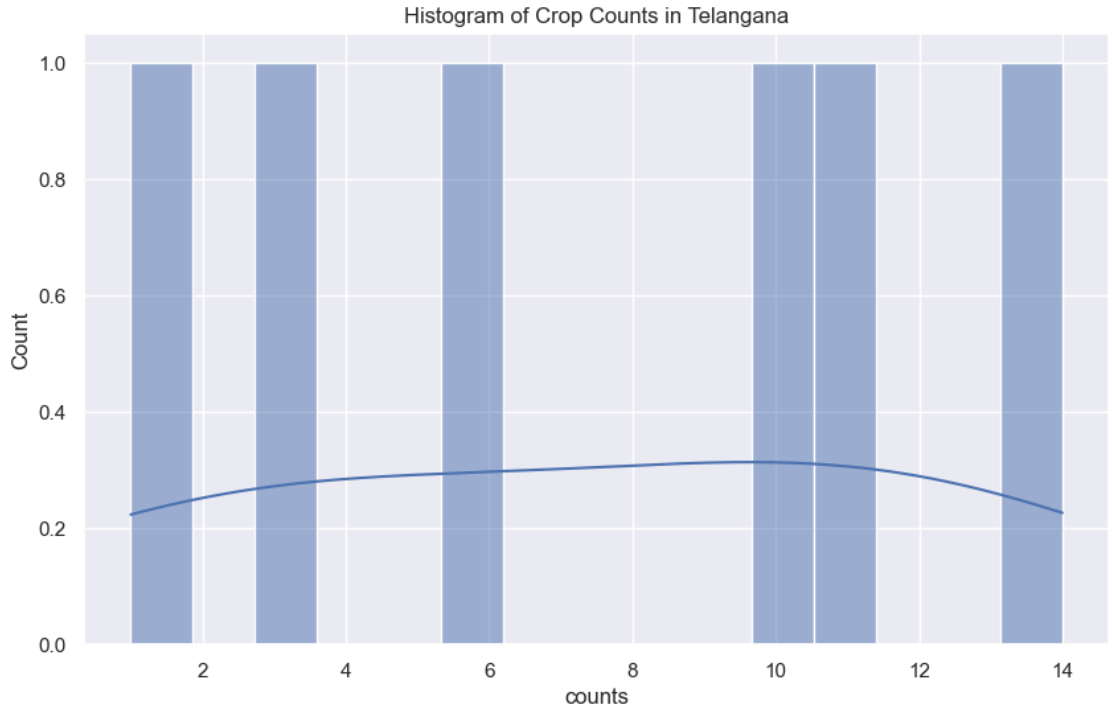
Pie Chart for Crop Distribution

[146]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Telangana')
plt.pie(telangana_crop_distribution['counts'],␣
 ↪labels=telangana_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in Telangana

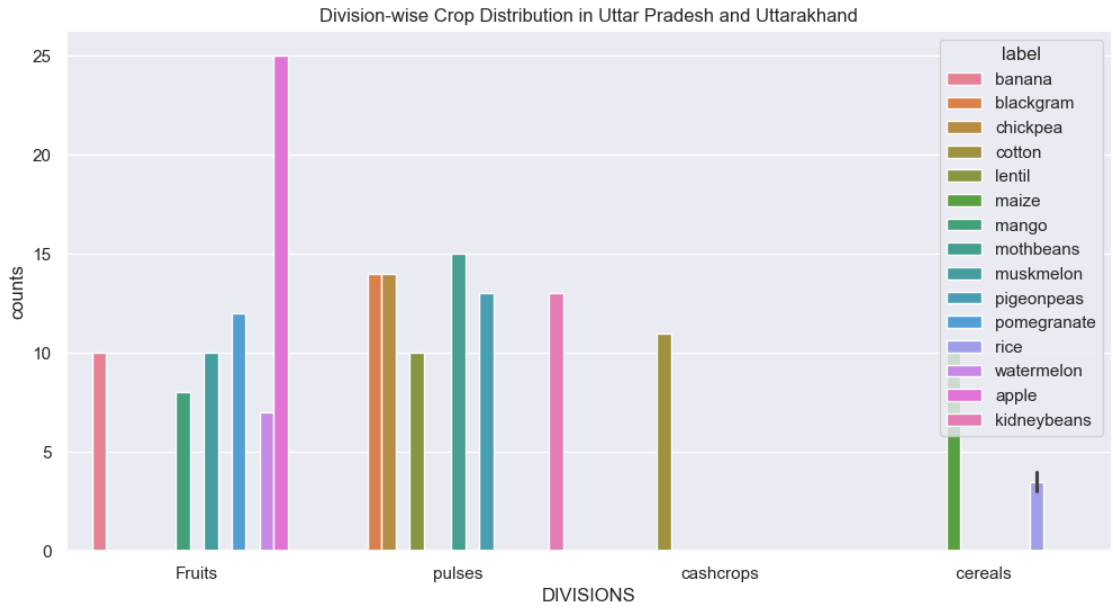
[147]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Telangana')
sns.histplot(telangana_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



UttaraKhand

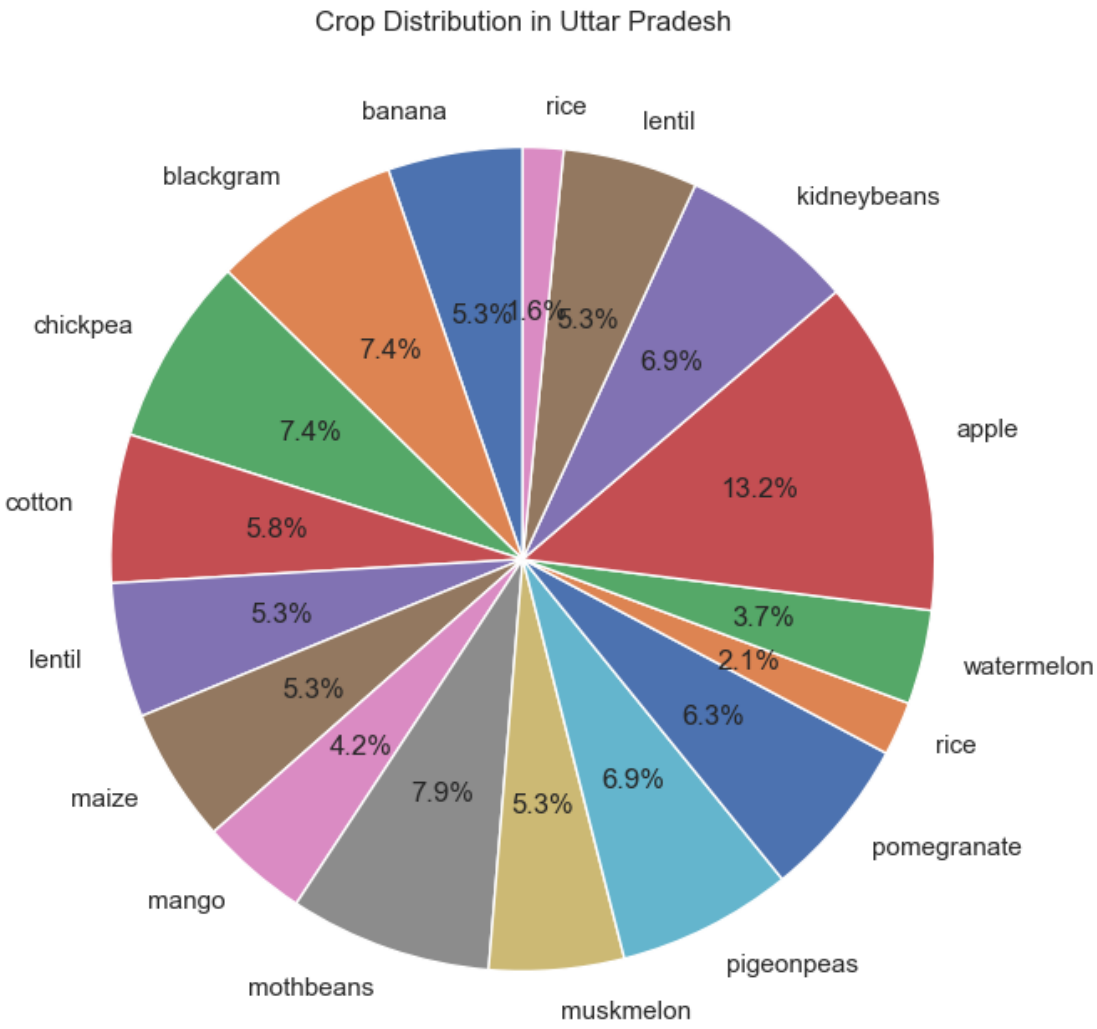
Bar Chart for Crop Distribution by Division in Uttar Pradesh

[150]:
```
uttar_pradesh_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States'].
 ↪isin(['UttarPradesh', 'UttaraKhand'])]

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Uttar Pradesh and Uttarakhand')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=uttar_pradesh_crop_distribution)
plt.show()
```



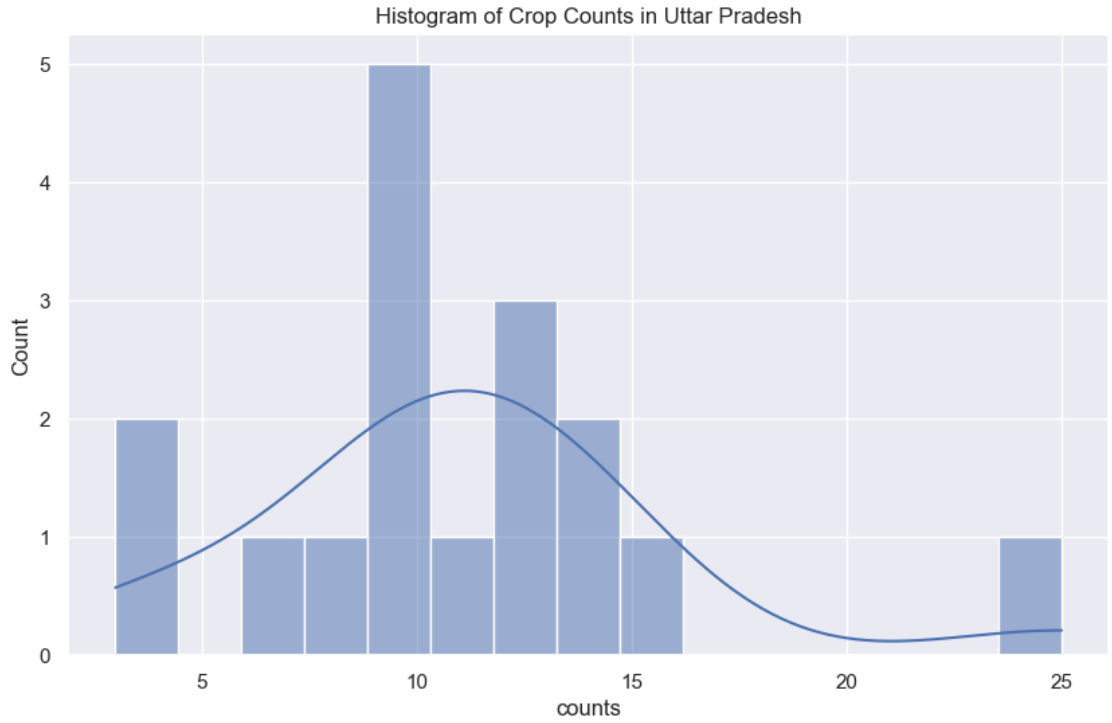
Pie Chart for Crop Distribution in Uttar Pradesh

[151]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Uttar Pradesh')
plt.pie(uttar_pradesh_crop_distribution['counts'],␣
 ↪labels=uttar_pradesh_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



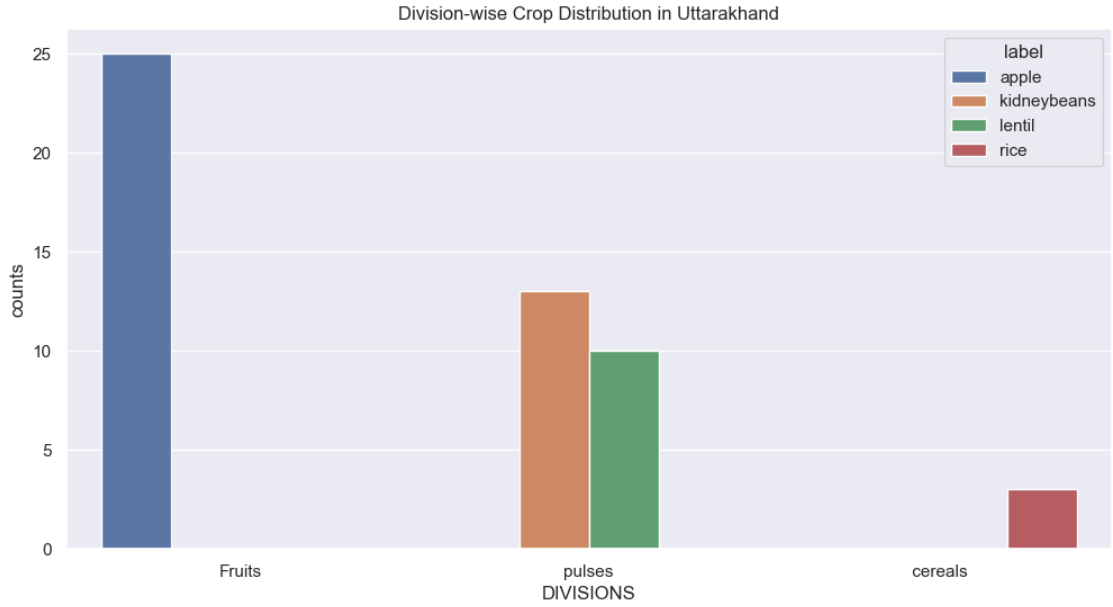
Histogram for Crop Counts in Uttar Pradesh

[152]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Uttar Pradesh')
sns.histplot(uttar_pradesh_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



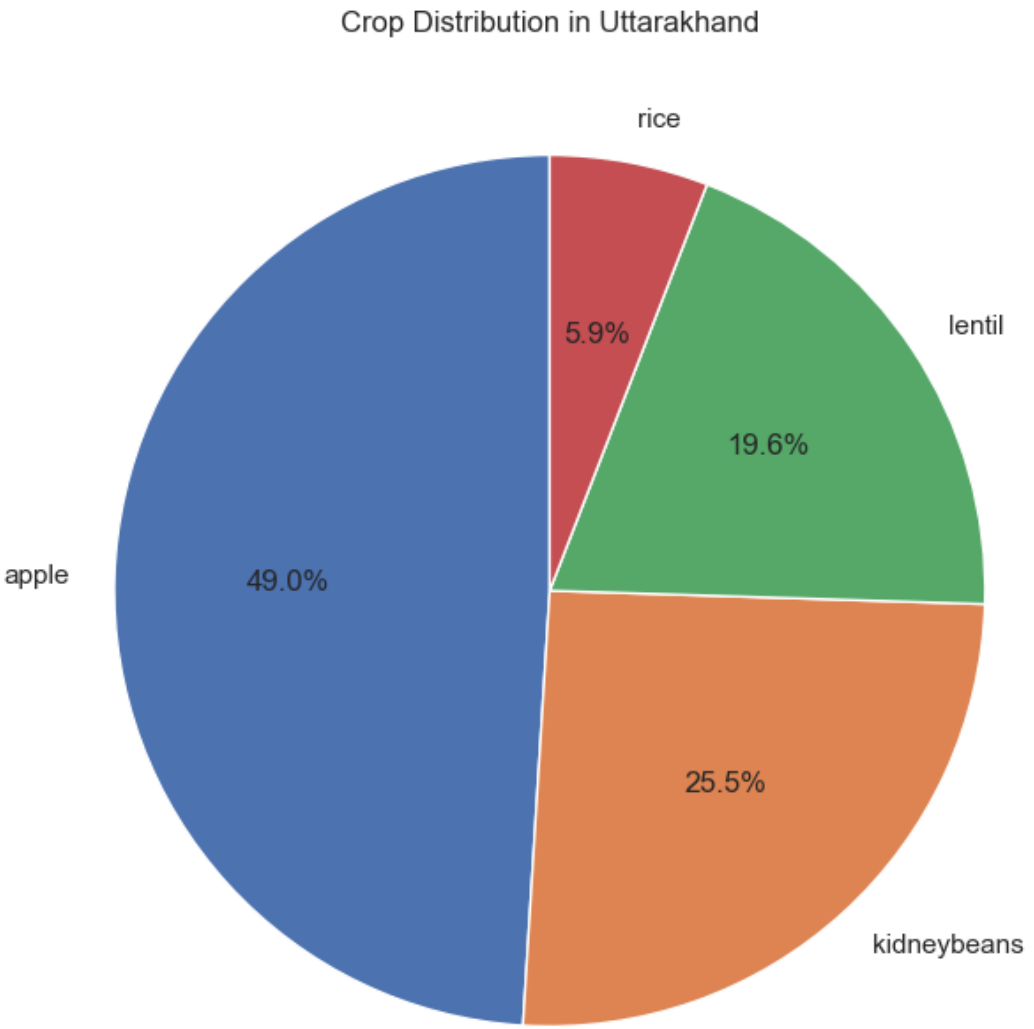
Uttarakhand

[153]:
```
uttarakhand_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'UttaraKhand']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in Uttarakhand')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=uttarakhand_crop_distribution)
plt.show()
```



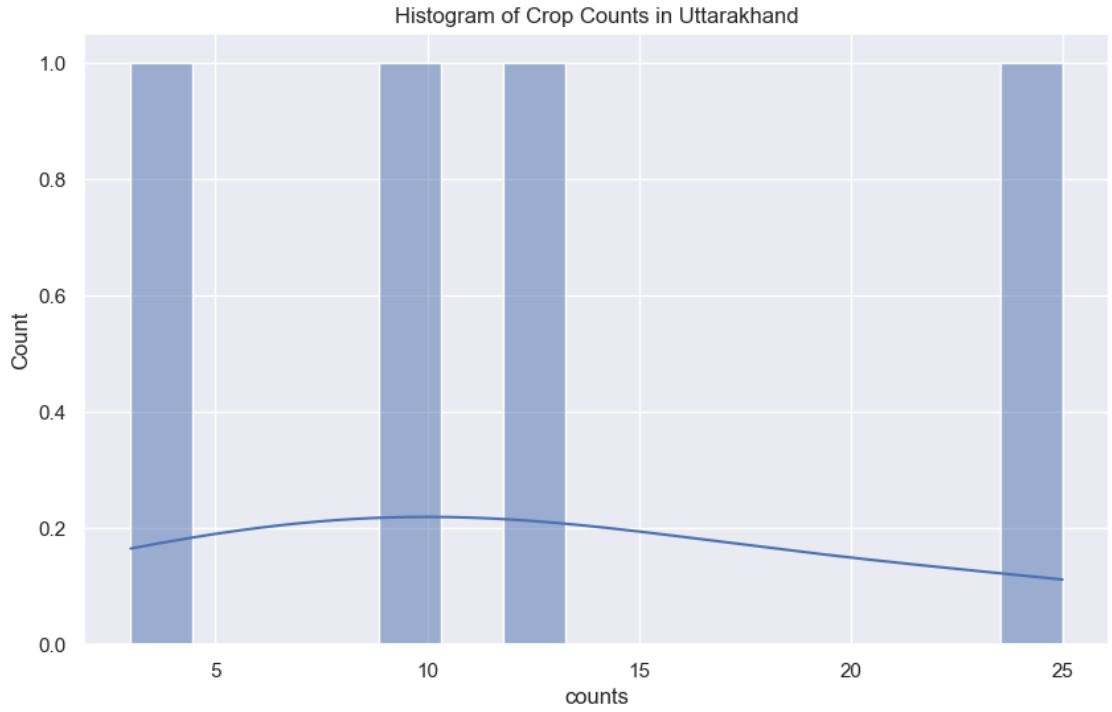
Pie Chart for Crop Distribution in Uttarakhand

[154]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in Uttarakhand')
plt.pie(uttarakhand_crop_distribution['counts'],␣
 ↪labels=uttarakhand_crop_distribution['label'], autopct='%1.1f%%',␣
 ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in Uttarakhand

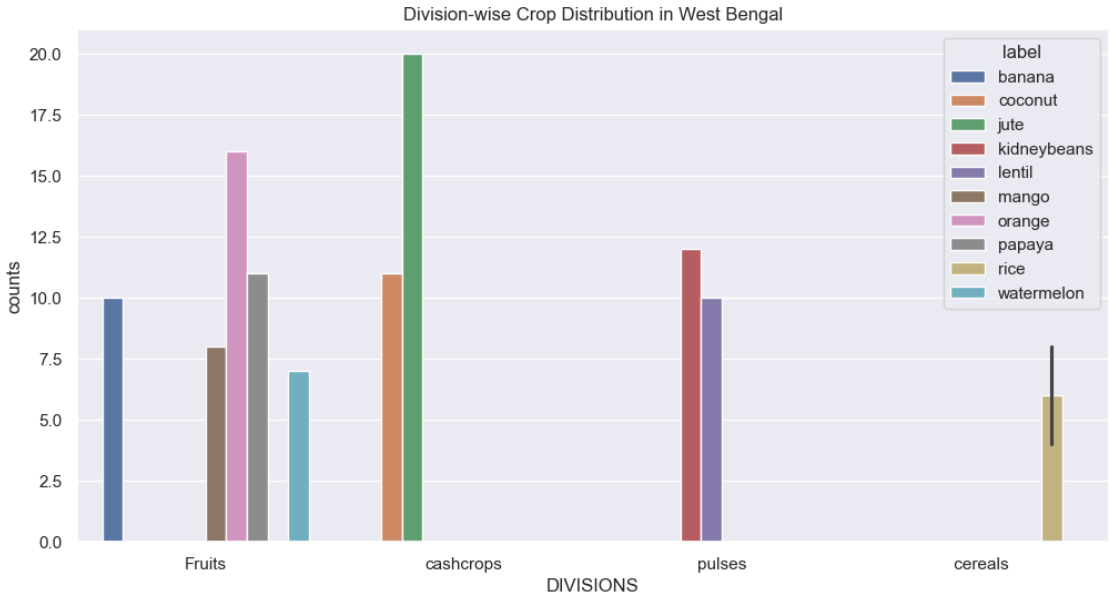
[155]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in Uttarakhand')
sns.histplot(uttarakhand_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



West Bengal

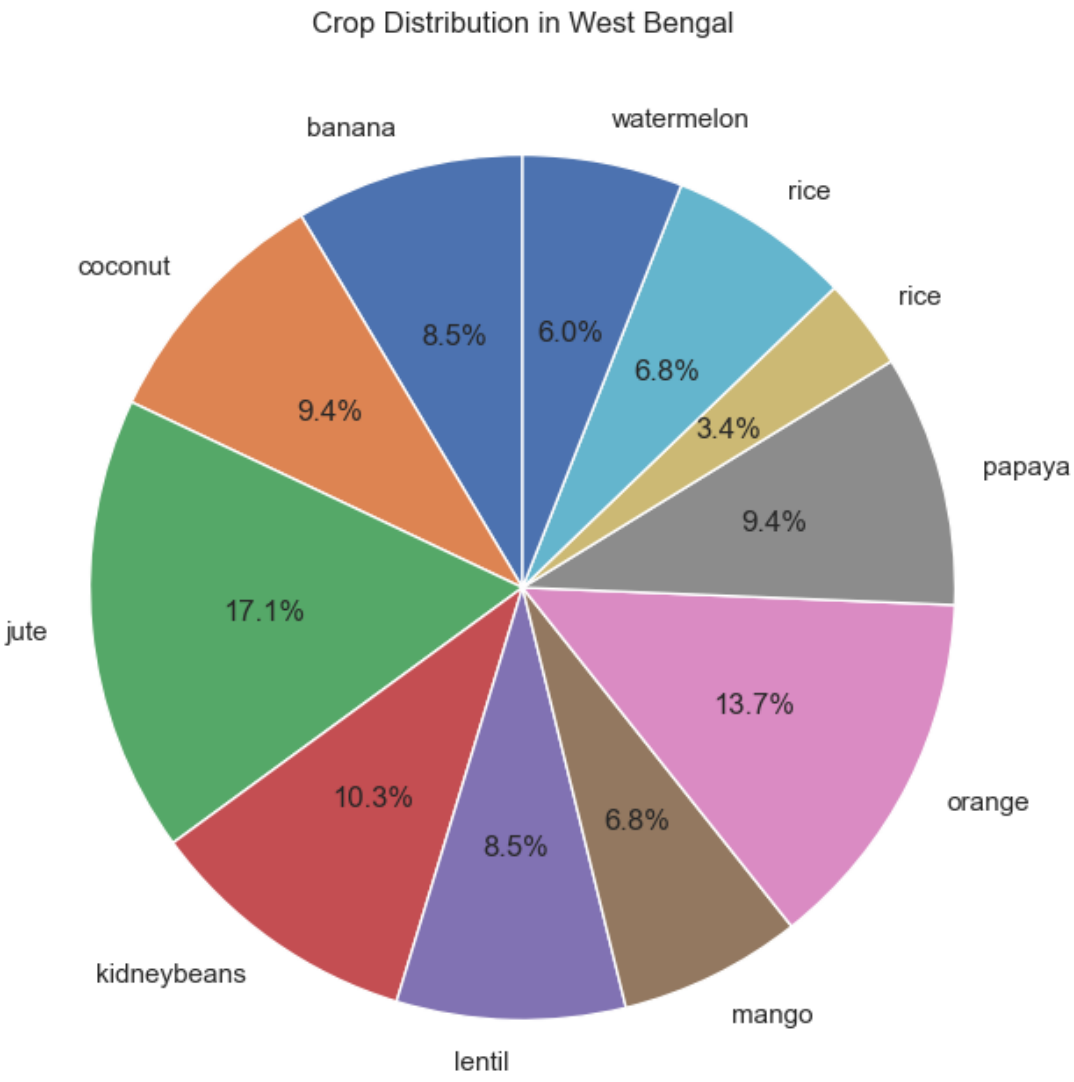
Bar Chart for Crop Distribution by Division in West Bengal

[156]:
```
west_bengal_crop_distribution =␣
 ↪state_crop_division_season_counts[state_crop_division_season_counts['States']␣
 ↪== 'WestBengal']

plt.figure(figsize=(12, 6))
plt.title('Division-wise Crop Distribution in West Bengal')
sns.barplot(x='DIVISIONS', y='counts', hue='label',␣
 ↪data=west_bengal_crop_distribution)
plt.show()
```



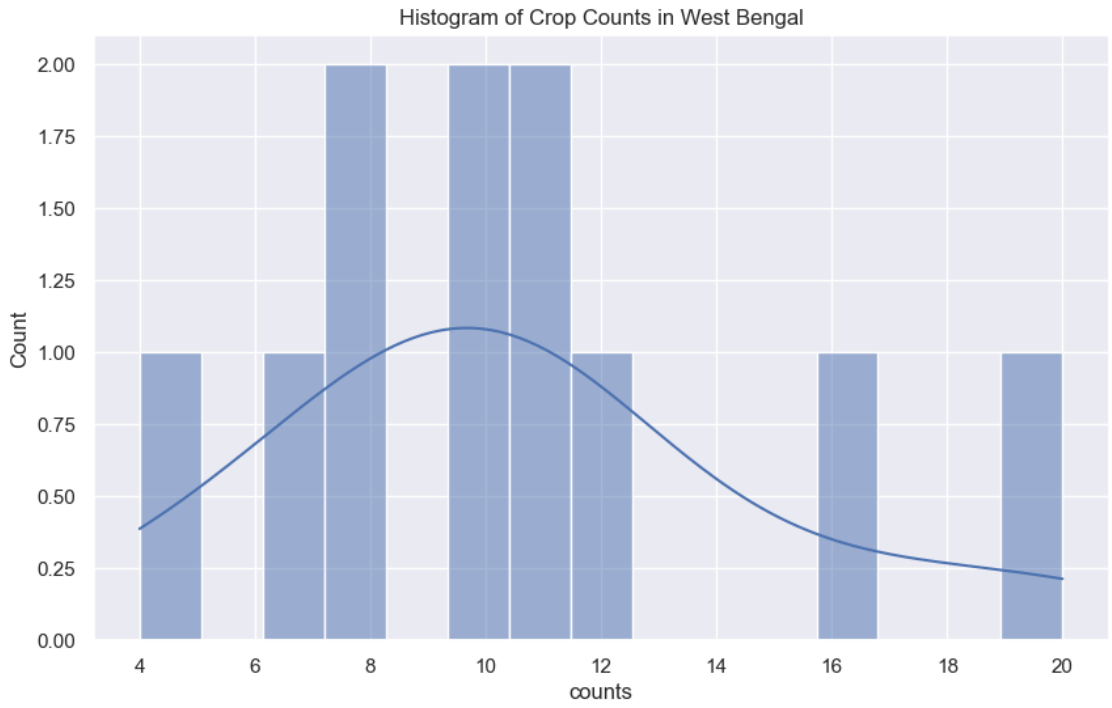
Pie Chart for Crop Distribution in West Bengal

[157]:
```
plt.figure(figsize=(8, 8))
plt.title('Crop Distribution in West Bengal')
plt.pie(west_bengal_crop_distribution['counts'],␣
  ↪labels=west_bengal_crop_distribution['label'], autopct='%1.1f%%',␣
  ↪startangle=90)
plt.show()
```



Histogram for Crop Counts in West Bengal

[158]:
```
plt.figure(figsize=(10, 6))
plt.title('Histogram of Crop Counts in West Bengal')
sns.histplot(west_bengal_crop_distribution['counts'], bins=15, kde=True)
plt.show()
```



[159]:
```
crop.head()
```

[159]:

	temperature	humidity	ph	rainfall	ph after harvest	Season	\
0	20.879744	82.002744	6.502985	202.935536	5.5	Kharif	
1	21.770462	80.319644	7.038096	226.655537	5.6	Kharif	
2	23.004459	82.320763	7.840207	263.964248	5.7	Kharif	
3	26.491096	80.158363	6.980401	242.864034	5.8	Kharif	
4	20.130175	81.604873	7.628473	262.717340	5.9	Kharif	

	DIVISIONS	States	label
0	cereals	UttarPradesh	rice
1	cereals	Maharashtra	rice
2	cereals	Punjab	rice
3	cereals	HimachalPradesh	rice
4	cereals	WestBengal	rice

Avg rainfall

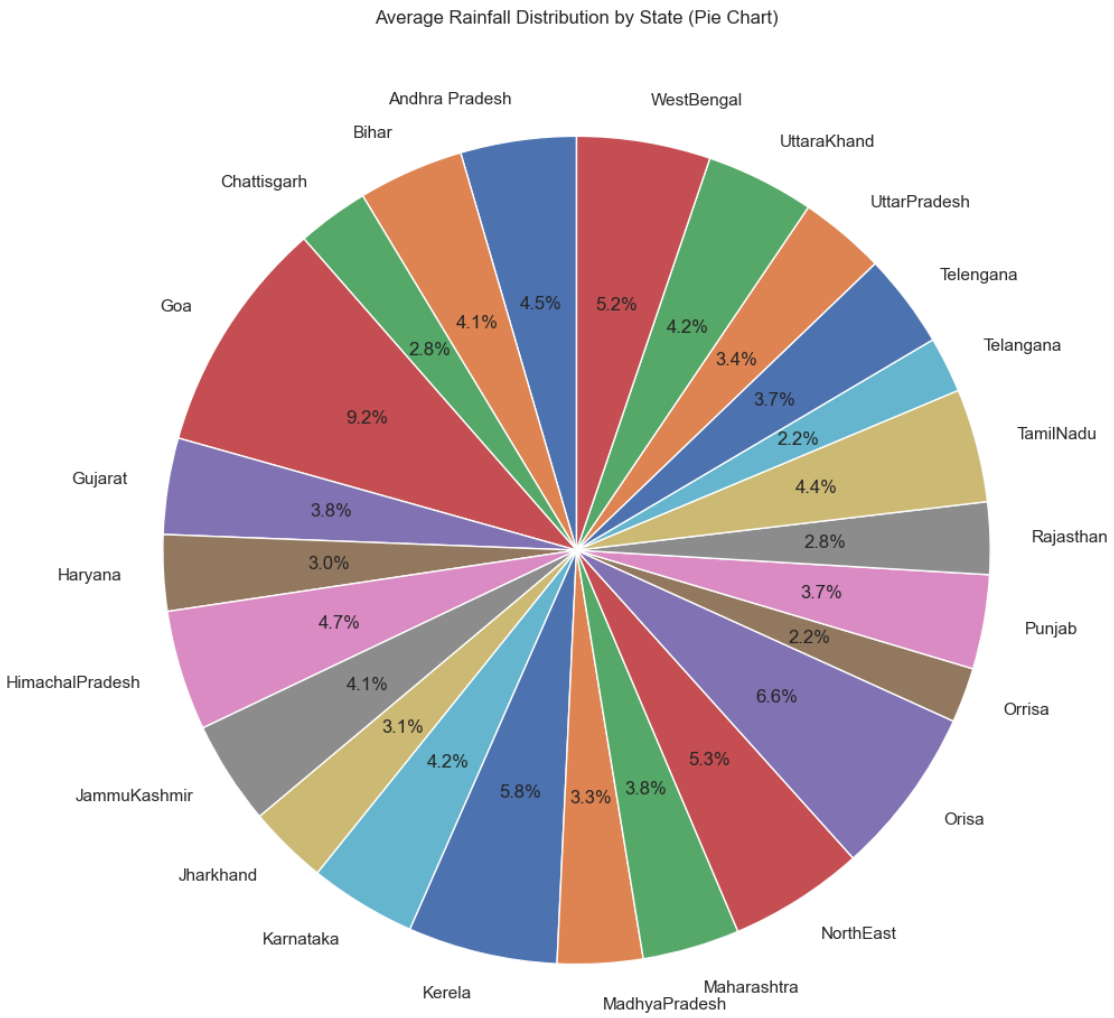
[160]:
```
avg_rainfall_by_state = crop.groupby('States')['rainfall'].mean()


print(avg_rainfall_by_state)
```

```
States
Andhra Pradesh     114.196210
```

```
Bihar              104.188633
Chattisgarh         70.805001
Goa                231.979983
Gujarat             94.980783
Haryana             75.013345
HimachalPradesh    118.630914
JammuKashmir       102.323164
Jharkhand           78.619382
Karnataka          105.525933
Kerela             147.569848
MadhyaPradesh       84.196299
Maharashtra         95.953616
NorthEast          133.168490
Orisa              166.068648
Orrisa              54.306574
Punjab              92.948184
Rajasthan           71.105300
TamilNadu          111.990539
Telangana           55.093938
Telengana           93.033211
UttarPradesh        84.982609
UttaraKhand        107.103463
WestBengal         131.925840
Name: rainfall, dtype: float64
```

Pie Reprasentation

[169]:
```
plt.figure(figsize=(12, 12))
plt.title('Average Rainfall Distribution by State (Pie Chart)')
plt.pie(avg_rainfall_by_state, labels=avg_rainfall_by_state.index, autopct='%1.
↪1f%%', startangle=90)
plt.show()
```



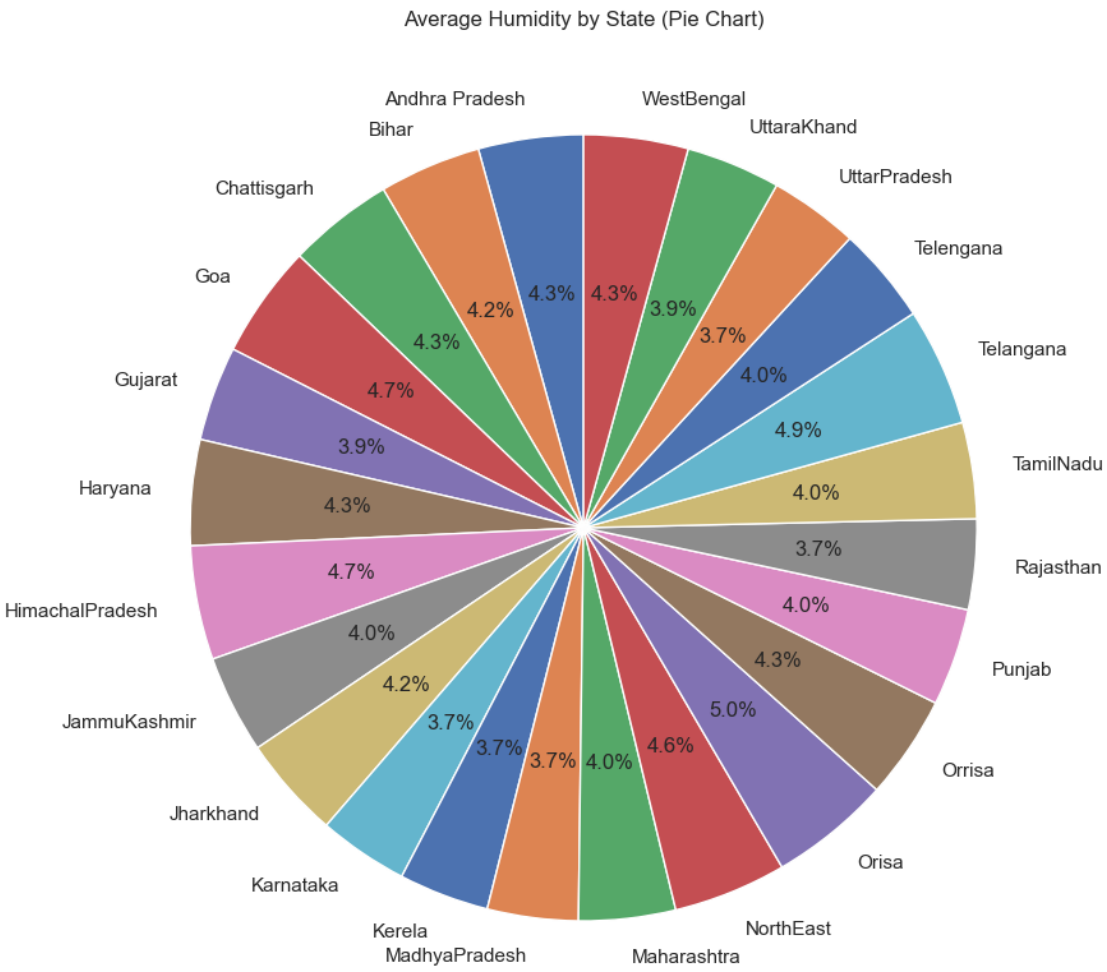
[170]:
```
avg_humidity_by_state = crop.groupby('States')['humidity'].mean()


print(avg_humidity_by_state)
```

```
States
Andhra Pradesh     75.675915
Bihar              73.558372
Chattisgarh        76.252168
Goa                81.688577
Gujarat            68.360586
Haryana            76.244589
HimachalPradesh    82.283303
JammuKashmir       70.858491
```

```
Jharkhand          73.857328
Karnataka          64.795038
Kerela             65.091520
MadhyaPradesh      65.558636
Maharashtra        69.784465
NorthEast          81.623564
Orisa              87.266382
Orrisa             74.725587
Punjab             70.308057
Rajasthan          65.215651
TamilNadu          69.456901
Telangana          85.213187
Telengana          70.048362
UttarPradesh       64.345742
UttaraKhand        68.100287
WestBengal         75.305836
Name: humidity, dtype: float64
```

Pie reprasentation

[171]:
```
plt.figure(figsize=(10, 10))
plt.title('Average Humidity by State (Pie Chart)')
plt.pie(avg_humidity_by_state, labels=avg_humidity_by_state.index, autopct='%1.
↪1f%%', startangle=90)
plt.show()
```



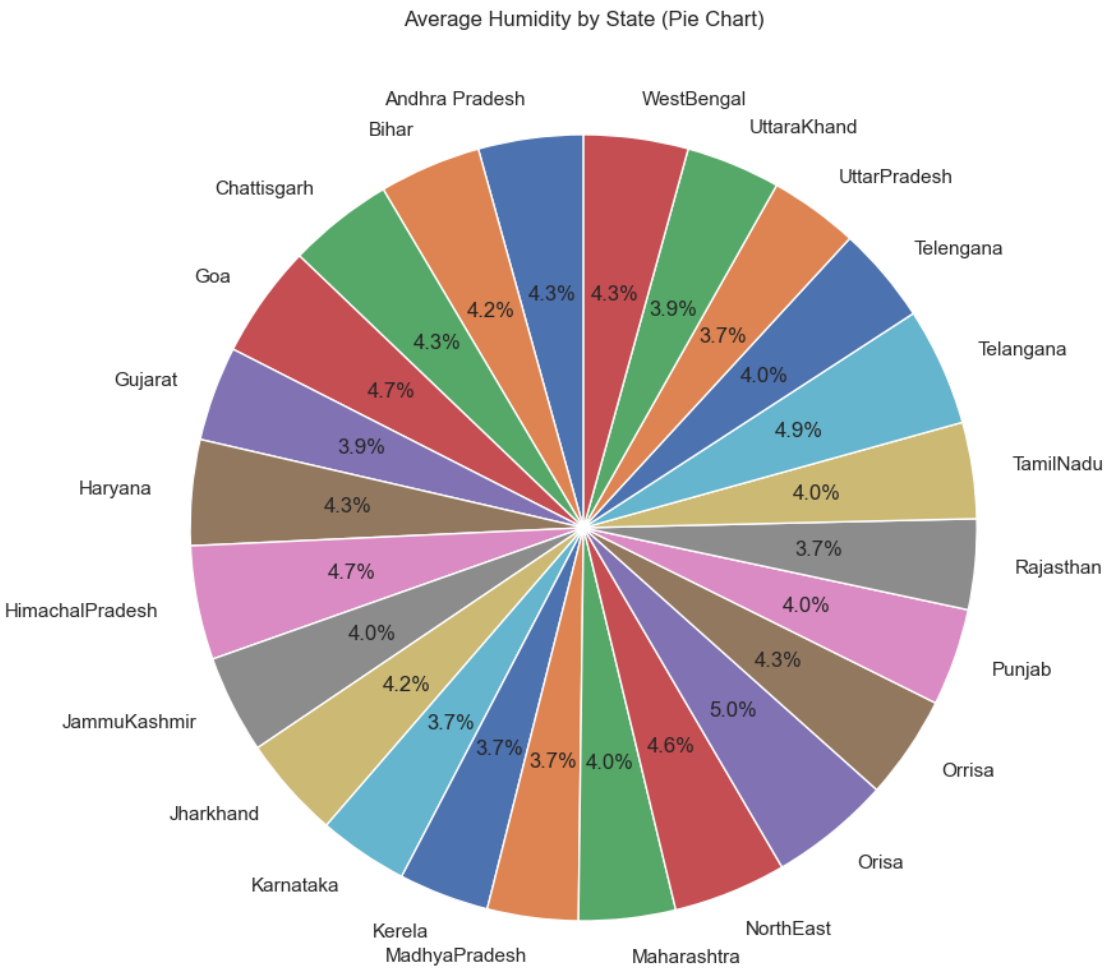
[173]:
```
avg_temparature_by_state = crop.groupby('States')['humidity'].mean()


print(avg_temparature_by_state)
```

```
States
Andhra Pradesh     75.675915
Bihar              73.558372
Chattisgarh        76.252168
Goa                81.688577
Gujarat            68.360586
Haryana            76.244589
HimachalPradesh    82.283303
JammuKashmir       70.858491
Jharkhand          73.857328
Karnataka          64.795038
```

```
Kerela              65.091520
MadhyaPradesh       65.558636
Maharashtra         69.784465
NorthEast           81.623564
Orisa               87.266382
Orrisa              74.725587
Punjab              70.308057
Rajasthan           65.215651
TamilNadu           69.456901
Telangana           85.213187
Telengana           70.048362
UttarPradesh        64.345742
UttaraKhand         68.100287
WestBengal          75.305836
Name: humidity, dtype: float64
```

Pie reprasentation

[176]:
```
plt.figure(figsize=(10, 10))
plt.pie(avg_humidity_by_state, labels=avg_humidity_by_state.index, autopct='%1.
↪1f%%', startangle=90)
plt.title('Average Humidity by State (Pie Chart)')
plt.show()
```



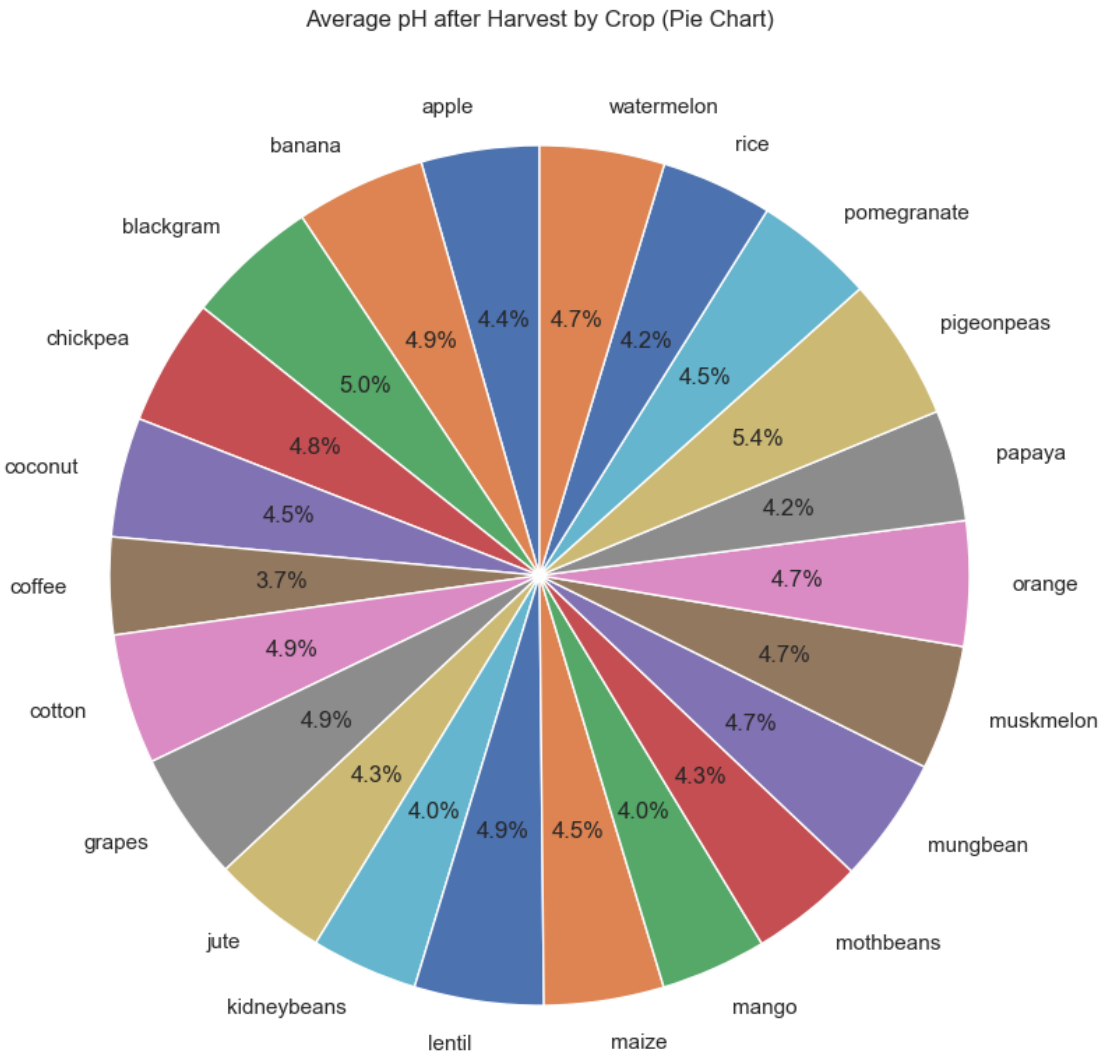
[177]:
```
avg_ph_after_harvest = crop.groupby('label')['ph after harvest'].mean()


print(avg_ph_after_harvest)
```

```
label
apple          6.365
banana         6.995
blackgram      7.138
chickpea       6.834
coconut        6.450
coffee         5.242
cotton         7.024
grapes         6.960
jute           6.200
kidneybeans    5.746
```

```
lentil          6.960
maize           6.460
mango           5.706
mothbeans       6.138
mungbean        6.782
muskmelon       6.726
orange          6.732
papaya          5.996
pigeonpeas      7.726
pomegranate     6.460
rice            6.000
watermelon      6.726
Name: ph after harvest, dtype: float64
```

Pie reprasentation

[178]:
```
plt.figure(figsize=(10, 10))
plt.pie(avg_ph_after_harvest, labels=avg_ph_after_harvest.index, autopct='%1.
  ↪1f%%', startangle=90)
plt.title('Average pH after Harvest by Crop (Pie Chart)')
plt.show()
```


Average pH after Harvest by Crop (Pie Chart)
apple
watermelon
banana
rice
blackgram
pomegranate
chickpea
pigeonpeas
coconut
papaya
coffee
orange
cotton
muskmelon
grapes
mungbean
jute
mothbeans
kidneybeans
mango
lentil
maize
4.4%
4.7%
4.9%
4.2%
5.0%
4.5%
4.8%
5.4%
4.5%
4.2%
3.7%
4.7%
4.9%
4.7%
4.9%
4.7%
4.3%
4.3%
4.0%
4.0%
4.9%
4.5%

[ ]: